HETEROGENEOUS CHOICE IN THE DEMAND FOR AGRICULTURE CREDIT IN CHINA: RESULTS FROM AN IN-THE-FIELD CHOICE EXPERIMENT

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ABSTRACT

The difficulty of financing agriculture in rural China has hindered the development of China's rural economy for a long time. The conflicts between the high risk and low profit of farmers has led to a significant imbalance between credit demand and supply. Therefore, understanding the characteristics and preference of credit demand for farmer households is an important problem to solve.

In this study, we mainly focus on demand-side of credit in rural China and aims to understand attribute preferences and the willingness of farmers to pay for credit. In chapter one, we introduce the background of current issues in rural finance. In chapter three, implementation of experiments including identifying attributes and levels, creating the experiment design and designing a complimentary survey provided in detail. We introduce how we did two experiments in five provinces in rural China. After deciding to select interest rate, term of loan, type of loan, type of repayment, type of institution and mobile banking service as attributes, we collected 120 combination, 3600 observations and 300 surveys in first experiment, 81 combination, 3241 observations and 120 surveys in second experiment. We choose a discrete choice experiment as the tool to collect data from the field. With a D-optimal and efficient experimental design for the choice experiments, we ultimately calculate the willingness to pay (WTP) using a mixed Logit model. This is described in chapter four. Subsequently, in chapter five, the estimating results from conditional Logit and mixed Logit models are provided and discussed. Mixed Logit is highly flexible model that can approximate random utility model, which can be used to estimate the effect of the attributes on utility. Then the

results from Mixed Logit model are used to calculate WTP, which can measure the change in interest rate associated with a unit change in each attribute. In chapter six, we finally draw a conclusions concerning the nature, characteristics, and preferences for credit demand from previous five chapters. We found that amortization loans with longer term are preferred even though they are highly cost. Farmers are willing to pay more for guaranteed loan and credit loan. Willingness to pay for institutions vary from provinces to provinces, which may be explained by distinct financial environment. The conclusions can provide answer to some extent of questions that why the efficiency of credit demand is and how to ameliorate the severely mismatch of supply and demand of credit in rural china.

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BIOGRAPHICAL SKETCH

Nan Meng was born in Yangling, China, which is a small city in the northwest of China. She graduated from Northwest University of Agriculture and Forestry in Shaanxi in 2017 and decided to search more opportunities in Cornell in 2017. Under the instruction of her mentor, she decides to extend his research fields to credit demand.

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CHAPTER 1

INTRODUCTION

The difficulty of financing agriculture in rural China has hindered the development of China's rural economy for a long time. The conflicts between the high risk and low profit of farmers has led to a significant imbalance between credit demand and supply. Therefore, understanding the characteristics and preference of credit demand for farmer households is an important problem to solve.

Rural financial development has been at the forefront of agricultural and rural economic development in China in the modern era since at least 2003. Policies have been promulgated, and the regulatory and oversight activities of rural credit have been strengthened through the China Banking Regulatory Commission. Since being identified as a key objective in the N0. 1 Central Document issued by the government in 2006, advancements in credit delivery has made tremendous contributions in supporting and promoting the development of the rural economy. The No.1 Central Document of 2019, promulgated recently, continues to focus on the rural issues, all of which are about rural financial reform.

With the development of economic reforms, China's rural formal finance has improved considerably. A multi-level and comprehensive service system of policy banks, commercial banks, cooperative Institutes and new rural financial institutions have been formed. However, the progress of rural financial reform has a significant lag compared with the development of the rural economy. The system shortage of funds is caused by imperfections of the rural financial system may, despite progress, restricting rural development in China from its social optimal potential. The main challenges in

rural China now are outflowing of rural funds, seriously credit rationing, a contradiction between capital supply and demand, as well as market failures in some rural financial markets.

Agricultural credit has played a significant role in helping farmers escape poverty and increase wealth. As an important part of China's rural production and management activities, farmers can change their resource endowments, expand production and increase income through obtaining credit (Weston & Strahan, 1996). With the development of emerging agriculture, rural credit demand has further been expanded. At the end of 2016, credit files of 172 million farm households had been established, and about 92.48 million farm households had obtained loans with a loan balance of 2.7 trillion yuan.

Table 1-1 Situation of Economics and Loan

Year	GDP	Agriculture Add Value	Ratio of Agriculture value	Loan	Agriculture Loan	Ratio of Agriculture Loan
2008	31,603	3,370	10.66%	303,394	6,912	2.28%
2009	34,032	3,523	10.35%	399,684	9,132	2.28%
2010	39,976	4,053	10.14%	479,195	11,766	2.46%
2011	47,310	4,749	10.04%	547,947	14,602	2.66%
2012	51,947	5,237	10.08%	629,910	17,623	2.80%
2013	56,885	56,95	10.01%	718,961	20,889	2.91%
2014	64,397	5,834	9.06%	816,770	23,600	2.89%
2015	68,551	6,087	8.88%	939,540	26,352	2.80%
2016	74,359	6,367	8.56%	1,066,040	28,234	2.65%
2017	82,712	6,547	7.92%	1,201,321	-	-

Data Source: National Bureau of Statistics of China

Table 1-1 shows the proportion of the total amount of agricultural loans of financial institutions in China, the total amount of loans of financial institutions and the proportion of total agricultural added value in GDP over the latest ten years. According to the use of funds, agriculture loans can be divided into agriculture, forestry, animal

husbandry and fisheries loans and other agriculture-related loans. From the table, we can see that both agricultural value and agriculture loan has been increased since 2008. By the end of 2016, the amount of agriculture loan goes up to 28,234 million yuan.

However, the growth rate of agriculture loans has decreased from 32.12% to 7.14% from 2008 because of decreasing increase rate of economic development. By comparison, we find that the proportion of agricultural loans in China's financial institutions' loans is much smaller than that of agriculture to the national economy. The financial support is still far from enough.

He et al. (2018) concludes that as strong as the rural credit demand is, formal credit satisfaction is still low and farmers' credit rationing is still serious. By the end of December 2017, the balance of national agricultural loans reached 30.95 trillion yuan. However, using auto-regressive and moving average models, Chinese researcher Li (2017) forecasted that there will still be a large huge rural financial gap in the following year, 8.98 trillion, 11.63 trillion and 13.05 trillion yuan in 2018, 2019 and 2020 respectively. The circumstances of this rural credit gap suggests wide-spread credit rationing (Turvey, 2012). On the supply-side, farmers' effective satisfaction of credit demand can smooth consumption and play an irreplaceable role in promoting rural economic growth, improving economic structure and maintaining social stability. The formal credit market is constrained because of the fragile nature of agricultural production and lack of insurance as well as saving (Tang, Guo 2017).

Though rural credit development is restricted by deficiency of supply, the inefficiency of rural credit is mainly caused by a mismatch between supply and demand. Understanding the demand-side of rural credit is crucial. For example, increase supply

would be effective if aggregate demand was highly elastic and less so if high inelastic. At present, rural financial service is difficult to adapt to the development of farmer's demand. Chinese research Ma and Xu (2018) have largely focused on the identification of credit constraints: demand-based and supply-based credit constraints. For a sample of farms who clearly have credit demand, based on whether there are insufficient supply or oversupply, divides the sample into "supply-side credit inhibition" and "demand-side credit inhibiting" groups. The empirical results show that the main reason for rural credit inhibition in China is demand-based credit constraints caused by risk.

Rural finance is a core way to solve the deficiency of rural funds and to promote the development of rural economy. Increases in farm households' credit demand is the typical performance of the rural finance development process. In china, there is a widespread mismatch between credit supply and credit demand. With the continuous development of the rural economy and the deepening of the rural financial reform process, the characteristics of rural credit demand are going through significant changes. As credit demand is of significance in developing rural financial market, digging out efficiency demand and satisfying demand is important. Therefore, we need to clarify the credit demand of farmers and its influencing factors, which will help to further improve the existing rural financial system and arrange rural financial resources more efficiently.

To further understand credit demand, this thesis focuses on the attributes which exert influence on farm household decision about credit. Based on the measurement of farmers' credit preference and the difference of willingness to pay, we can evaluate farmer's preference of credit from the perspective of the demander, which will help to

improve the efficiency of credit demand and to complete credit policy so that rural finance plays a more crucial role in supporting economic development in rural China.

The overall objective of this study is to investigate the characteristics affecting credit demand in china. The specific objectives are to identify the characteristics affecting credit demand and to determine the willingness to pay for these attributes through development of an in-the-field choice experiment. Based on the modern rural financial theory, the study selects interest rate, term of loan, type of loan, type of repayment, institution and mobile banking services as attributes, implements two discrete choice experiments in Shandong, Sichuan, Shaanxi, Henan and Jiangsu provinces in rural China. After analyzing the preference and willingness of borrowers for credit product from demand-side, the study will put forward suggestions for designing flexible financial services to improve efficient demand.

The study proceeds with a review of the relevant literature that enlighten this study, followed by the underlying methodology applied when processing and analyzing the data collected from discrete choice experiment. The experimental, survey designs and implementations are described in the subsequent sections. Following this, the results from the estimation of the conditional and mixed Logit models are presented and discussed, then WTP (willingness to pay) estimates are reported. In the last section, we provide the summary and conclusions with regarding to the findings of preference for credit products.

CHAPTER 2

LITERATURE REVIEW

Chapter two is the theoretical basis of Rural Credit demand. We examine related theories concerning credit demand theory including credit demand behavior of farm household and influencing factors of credit demand, credit constraints and rationing theory and elasticity of credit demand theory. After concluding the existing literature, we put forward a new research problem to complete the research of rural credit.

2.1 Credit Demand Theory

There are a lot of studies about motivations of credit demand. Mushinski (1999) divided credit demand of farmers into nominal credit demand, effective credit demand and potential credit demand and proposed a mechanism to identify and classify three kinds of credit demand. A large portion of the capital expenditure of rural households in rural China is mainly used for weddings, funerals and children's education, not production and management.

2.1.1 Credit Demand Behavior of farm household

Farmers' motivation for lending can be classified into survival motivation, productive motivation, consuming motivation, speculative motivation, and inhibitory motivation. The middle-aged farmers are more likely to have productive motivation (Ghate, 1992). Ghate(1992) found that farmers' production-oriented lending in developing countries tends to be applied from a formal financial institution. For non-production-oriented funding needs, credit applications often turn to informal financial institutions (Zeller, 1994) (Doung & Izumida, 2002). In rural China, credit demand is mainly from formal and informal institutions. The existing research believe that

majority of rural fund come from informal financial institutions such as private lending. Rural Credit Cooperative (RCC) is the main rural formal institutions in rural China. Using data from over 1500 farm households, Turvey and Kong (2010) confirms a relationship between trust and informal lending. With over 67% of farm households borrowing from friends and relatives the economic significance between this form of informal lending and borrowing from Rural Credit Cooperatives and Micro Finance Institutions is important. In general, credit demand can also be divided into production demand and household-consumption demand. The former refers to the credit demand caused by agriculture enlargement and production, the latter refers to the credit demand generated by non-agricultural activities such as house constructions, medicine care, children's education. Some researchers point out that the household-consumption demand in rural China has exceeded the production demand. The main purpose of farmers is for daily activities and life.

2.1.2 Influencing Factors of Credit Demand

As for the influence factors of credit demand, the framework of research including literatures and methods is well established. According to Stigliz and Weiss (1981) , there is a strong correlation between the education as well as economic level of Chinese farmers and number of borrowing; with the increase in income, the propensity to apply credit loan for profitable investment has increased significantly. Using a Tobit regression model, Izumida and Pham (2002) did research about farmers' choice on credit source channels and indicated that family production scale and family livestock value are the main factors affecting farmer's choice of formal credit. Jappelli (2002) compared farmers in three villages through multi-regression model. The results showed

that farmers with lower land value had lower chance of obtaining loans from formal financial institutions than those with higher land value. In addition, family characteristics and the conditions of loans are another two influencing factors. Mpuga (2010) did research on rural credit demand in Uganda by constructing Logit, Probit and Tobit models. The factors that affect the credit demand of farmers are as follows: age, education level, location, asset and occupation. After researching the credit behavior of farmers in India, Charkavarty and Pal (2013) and found that credit can be positively correlated with the farmer's agricultural land value. The higher the land value is, the easier for farmer to obtain credit loan from financial institutions. Moreover, if the farmer has a salary-based income and sufficient borrowing experience, the possibility of obtaining loans from financial institutions is great. To avoid bias from endogeneity of interest rate and optimize econometrics method, Swain (2007) applied a type 3 Tobit model with data from Orissa and India. He figured out that interest rate, net-wealth, area of operational holdings, primary activity of the head of the household and output price are factors that determine demand for credit. In addition, according to Boucher (2002), farmers' credit demand will be reduced because of high transaction costs and high risks. As increase of transaction costs and risks, farmers form negatively expectations for future investments and voluntarily give up loans.

In China, based on data collected in 2007-2008 from Heilongjiang Province China, Tang and Guo (2017) show that households' decisions on whether to borrow are mainly determined by households' production capacity and the transactions costs. Increasing the accessibility of formal credits by reducing the transaction costs is an essential to enhance formal credit markets. Other studies examined factors such as savings relative

to households' production scale, collateral risk, policies and availability of credit markets. Han and Luo (2015) conducted a questionnaire survey of farmers in Gansu Province and concluded that there are differences in the factors affecting the credit demand of farmers in different regions, which may be due to different factors or different influencing factors. However, the family labor force has a significant impact on farmers' credit demand. For interest rate, it is generally considered that the impact on the credit demand of farmers is not obvious. Han Jun concluded that interest rates are not the main consideration for household credit. However, farm household income, production characteristics and family characteristics are the determining factors of farmers' borrowing behavior.

2.2 Credit Constraints and Rationing

2.2.1 Credit Constraints

Rural credit markets in developing and developed countries are very different. Developing countries have been severely facing credit constraints. Kritikos and Vigenina (2005) report that the reason for exclusion of the poor from financial markets contains a risk and cost component. Franklin Simtowe (2008) finds that households with more adult male members have a greater likelihood of facing credit constraints, wealthier households and household with higher value land are less likely to report credit constraints.

In China, Dong et al. (2012) uses data and switching regression model to explore the effect of credit constraints. Empirical estimates of the impacts of credit constraints on agricultural productivity are provided for the Heilongjiang province. By removing credit constraints, average agricultural productivity was estimated to be increased by 75

percent. Ma and Xu (2018) focus on identification of credit constraints: demand-based and supply-based credit suppression and the author states that the main reason for rural credit inhibition in China is demand-based credit suppression caused by risk. In addition, lowering loan interest rates and raising bank risk-taking ability is very effective in enhancing the credit support effect of demand-side credit suppression.

2.2.2 Credit Rationing

It is believed that credit rationing of financial institutions is one of the main reasons of credit constraints. Baltensperger (1978) first proposed the definition of credit rationing. Credit rationing is a situation in which the credit demand is still unsatisfied even if the borrower is willing to accept all the price in the credit contract. Boucher (2002) classifies credit rationing into quantity rationing, risk rationing, and cost rationing which negates the early theory that there only exists quantity rationing. Boucher and Carter (2008) developed a model that shows that asymmetric information can lead to two types of credit rationing: conventional quantity rationing, and risk rationing whereby household farm could borrow but only under high-collateral contracts with high well-being which sacrifice some security.

Based on research and studies, reasons for credit rationing are as follows: First, interest rate control and quantity restriction of rural credit funded by the government and high transaction costs of rural credit are the main reason of credit rationing to farm households. Second, since the 1980s, with the rise of the information economics theory, it is believed that avoiding adverse selection and moral hazard caused by information asymmetry result in credit constraints. Third, demand repression is also one of the reasons for the credit constraints of farmers. Storey (2004) found that many farm

households voluntarily give up loans for the reason that they lacked the confidence to apply for loans successfully or that they are faced higher transaction cost and higher refuse rate.

As for the reason and influence factors of credit rationing, there are many studies. Chaudhuri and Cherical (2012) constructed the BPSS model of credit-demand rationing and supply-demand rationing. According to He (2005) Credit rationing occurs because of the information asymmetry between formal and informal lenders. Because of the risks involved, formal lenders are only willing to lend to borrowers who can provide collateral.

Jia et al. (2010) found that the factors affecting farmers' demand-type rationing are: the education level of the head of household, whether they have obtained formal channel loans, bank loan interest rates, distance to bank outlets, and dummy variables in Luxi area. In practically, Jia indicates that pervasive credit rationing exists in the formal credit market in rural China. He figures out that farmer with social entitlement are less likely to be credit rationed. Human capital – in particular education – is crucial in determining the status of credit rationing in both formal and informal market. Households that rely more on agricultural revenue are less likely to be formally credit rationed. Leslie and Turvey (2014) investigate factors associated with risk rationed, price rationed and quantity rationed farmers through analyzing data from 730 farm households in the Shaanxi province of China and from 372 farmers in northeastern Mexico. They found that the incidence of risk rationing in farmers to be 6.5, 14 percent for quantity rationed and 80 percent for price rationed in China whereas 5 percent of the sample is risk rationed, 10 percent quantity rationed and 55 percent price rationed in Mexico. Specifically, poor farm household are more likely to be quantity rationed in China and

education level is important in determining quantity rationed in Mexico. Risk aversion and prudence are significantly correlated with risk rationing in China, while only risk aversion is significant in Mexico. In both countries, asset wealthy farmers are less likely to be risk rationed; however, income does not appear to have an impact.

2.3 Elasticity of Credit Demand

Credit demand elasticity is of high value when we try to solve the mismatch of credit demand and supply through improving efficient credit demand. Using survey data, Bogan et al. (2015) shows that micro-entrepreneurs have close to unit elastic demand for micro credit. At a given interest rate, the percentage change is met by nearly the equal percentage change in the demand quantity. Turvey et al. (2012) extracts individual household credit demand functions from demand elasticities with 897 farm households in Shaanxi and Gansu provinces. According to Turvey et al. (2012), the elasticities were highly heterogeneous across household farmers with some having high elasticities and others completely inelastic demands for credit. Elasticities were also affected by many demographic and economic factors. Credit demand is more inelastic at higher interest rates and less inelastic or elastic at lower interest rates. Farms with different ages, education levels and revenues have different demand elasticities. After running an experiment in China and Mexico, Leslie (2014) points out that credit demand elasticities differ among rating typologies. A large portion of risk rationed farmers have inelastic demands for credit but a lower interest rates even risk rationed farmers might enter the credit market. They conclude that it is important to deal with risk in order to increase agricultural investment and alleviate poverty.

2.4 Summary

In summary, above studies has analyzed the credit demand and credit constraints from different aspects. Some of scholars are committed to analyze influencing factors of credit demand of farm household. Some of them aims to construct measurement system of credit constraints and estimate the credit gap. Some researchers manage to calculate demand elasticities in order to better solve the credit deficiency. All of these provide detailed information and scientific methods of credit demand, which lay foundation for further research. However, the majority of existing studies blame the imbalance in the rural financial situation on a deficiency of supply, neglecting the demand-suppression of credit. We define the credit-demand rationing as people don't apply for credit even though they have a real demand for credit.

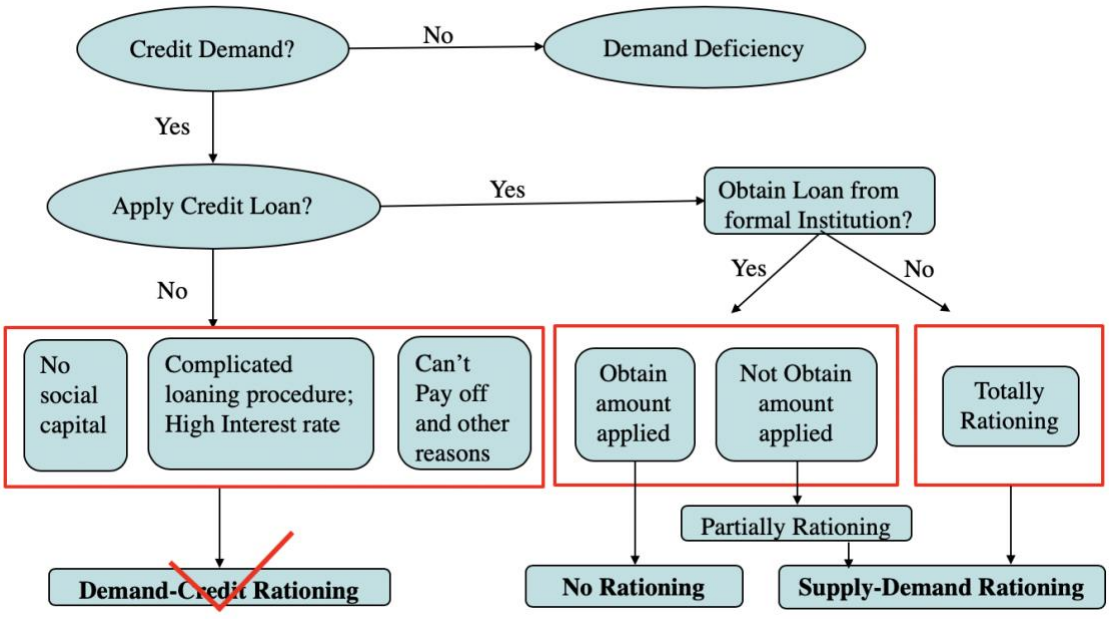

Figure 2-1 Credit Rationing Structure

Research regarding further depth of preference and willingness of credit demand is absent. Credit demand of farm household exhibits huge differences at different locations

and across different economic levels. In our study, we aim to focus more on demand-side of credit. In classic economic theory, the optimal amount of loan will be improved when there are positive value attributes in a given amount of supply, while optimal amount of loan will be decreased when there are negative value attributes.

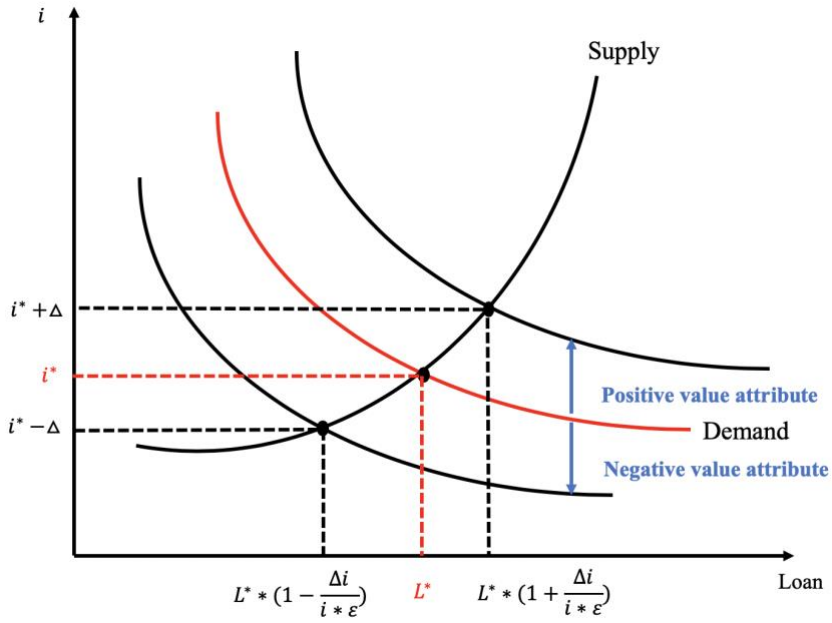

Figure 2 -2 Supply and Demand of Credit

As we aim to improve demand and ameliorate the credit-demand rationing, we ultimately provide estimates of the willingness to pay (WTP) for specific attributes of credit combination, which can give us more information of consumers' choice. We implement our experiments in five provinces with totally different natural resources and economic levels, and in doing so we illuminate the relationships between credit demand with different economics characteristics. The actual design of the choice experiment is provided in chapter 3, and the regression techniques employed are advanced in chapter 4

CHAPTER 3

EXPERIMENT IMPLEMENTATION AND DATA DESCRIPTION

In this chapter we introduce how we implement two experiments in rural China. There are four steps in designing: identifying attributes and levels, creating the experiment design, designing survey and estimating the choice model. The purpose of this chapter is to explicitly describe the whole process of discrete choice experiment. This is followed in Chapter 3 be a fuller explanation of the Mixed Logit regression used to analyze the choice data and determine the WTP values.

3.1 Experiment Design

Following Hoyos' and Victorino study, we develop four steps to design the whole experience which are in the following figure.

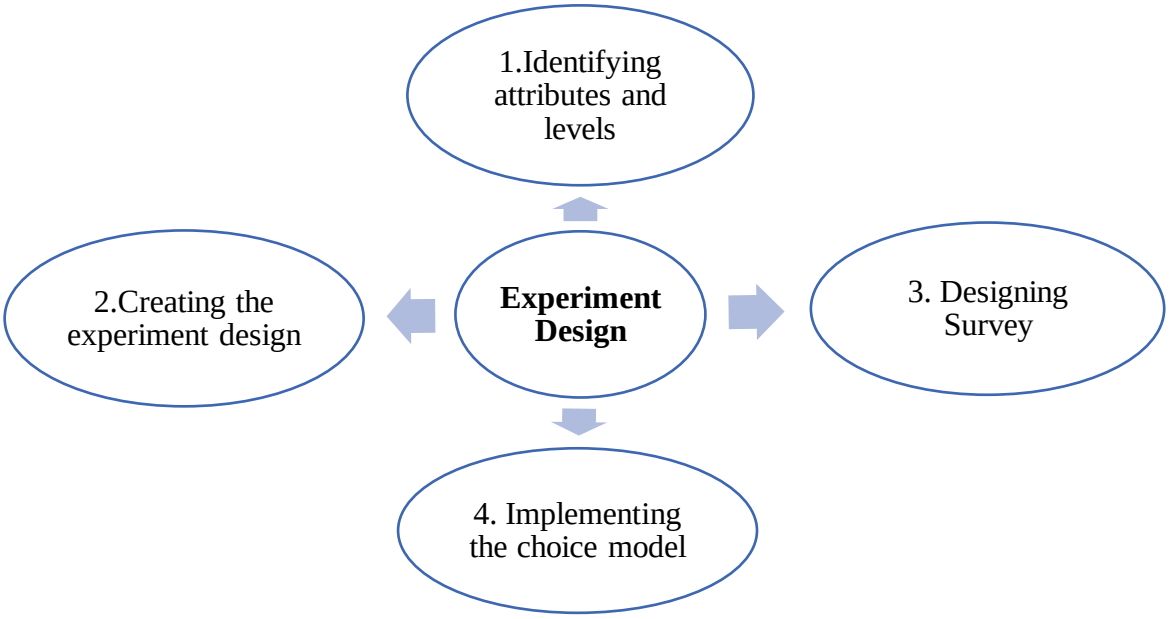

Figure 3-1 Experiment Design Process

3.1.1 Attributes and levels Identification

Attributes are product characteristics influencing consumer choice, which means products are made of attributes. As the size and complexity of choice experiments grow exponentially with increase in the number of attributes, we choose attributes carefully and literally (Crouch & Louviere, 2004). After prudently consider, interest rate, term of loan, type of loan, type of repayment, type of institution, mobile banking are selected to be attributes.

Interest Rate is the cost or price of credit, which is the most direct and deterministic characteristic of credit product for farm household. According to Keynes, consumer's demand of a product decrease with the rise of product cost. In other words, credit demand of farm household would decrease as the increase of interest rate. Interest rate is the most powerful tool for government and central bank to regulate the supply and demand of money. It is also the most significant factor of credit rationing and credit constraints in rural district. In China, interest rate is different with different financial institution and different term of loan. The lending interest rate is a benchmark interest rate from central bank plus floating interest rate from individual bank. Interest rate of RCC in 2018 is as following table:

Table 3-1 Benchmark Interest Rate with Different Term

Term		12/26/2010	4/6/2011	7/7/2011	7/6/2012	11/22/2014	5/11/2015	10/24/2015
Short-term Loan	0.5 Year	5.35	5.85	6.10	5.60	5.60	5.10	4.35
	1 Year	5.81	6.31	6.56	6.00	5.60	5.10	4.35
Long-term Loan	1-3 Year	5.85	6.40	6.65	6.15	5.75	5.25	4.75
	3-5 Year	6.22	6.65	6.90	6.40	6.00	5.50	4.75
	5 Year	6.40	6.80	7.05	6.55	6.15	5.65	4.90

Data source: China Statistical Yearbook

As an attribute, for interest rate, we set seven scenarios with interest rate rising and falling from the base rate. The levels of interest rate are: 2%, 4%, 6%, 8%, 10%, 12%, 14%.

Term of loan is another distinct characteristic of credit product. For lenders/ farmers, they always have demand of loan with long maturity term because agricultural production is a long-term activity which requires long-term investment and cultivation. However, longer-term of credit loan means higher cost. This is a trade-off between term of loan and cost of loan. For borrowers/financial institution, longer-term loan means high and steady profit whereas it also indicates that lenders take risks or may face liquidity crisis. To find the effect of term of loan in farm household credit decision, we add term of loan as an attribute. According to RCC, there are five different term of loan: Less than six months, six months to one year, one year to three years, three years to five years, longer than five years. The longer the term, the higher the interest rate. For borrowers, how to decide among loans with different term is a trade-off between actual situation and price.

Type of loan also effect farm household decision. There are three basic type of loan in rural China: Collateral Loan, Guaranteed Loan and Credit Loan. Collateral Loan is a loan with higher security and less risk because a collateral increases the expected return of the lender and creates an incentive for borrowers to avoid intentionally default (Feder, Onchan, & Raparla, 1988). Land property is now the most powerful and common collateral in rural China now. A Guaranteed Loan is a loan issued on the condition that a third party provides the corresponding guarantee for the borrower. The most common

guaranteed loan in rural China is group guarantee. Farmers form groups such that while they borrow individually, the group as a whole is responsible for each of its members' loans. It is expected that social pressures will minimize defaults. Risk in guaranteed loan is higher than collateral loan. A credit loan is a loan issued on the creditworthiness of the borrower, and the borrower does not need to provide a guarantee. Credit loan is seldom in rural China because it is of highest risk for lenders. Conversely, it is of lowest transaction cost for borrowers. These Three types of loan above are with different level of risk which is the main reason of different price of loans because loan transaction typically involve the risk of borrower default (Feder, Onchan, & Raparla, 1988). Collateral loan, guaranteed loan and credit loan are with risk from lowest to highest level, therefore the price (interest rate) of the three loans are increasing. For borrowers, how to decide among three type of loans is a trade-off between transaction cost and price.

Type of repayment is the fourth attribute we select. Basically, there are always two kind of repayment methods for farm household in rural China: pay off at one and amortization. Pay off at once means borrowers pays off the principal and interest of the loan at one time before or when the loan expires. It is generally applicable to a loan with small amount and short term. Amortization is a way that the principal of the loan will be repaid in equal amounts with decreasing interest every month during the loan period. It is used more when one applies large amount of loan. Amortization requires higher interest rate for the reason that it usually used in the loan with larger amount and longer term.

Institution is the fifth attribute we use. Rural financial Institutions exert decisive role in rural economic development. Since 1978, after reforms of rural finance, a complicated rural formal financial system with rural cooperating, commercial and policy financial institution have been formed. The structure of rural financial institutions is illustrated in Figure 3-2.

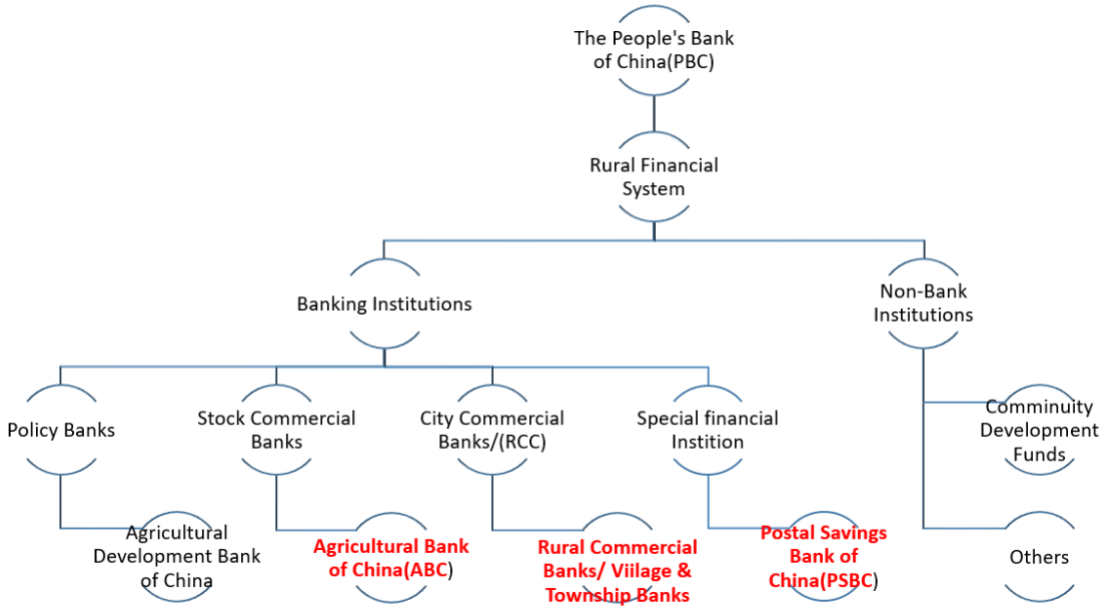

Figure 3-2 Structure of Rural Financial System

China's rural credit market is mainly served by Rural Credit Cooperatives (RCCs), Agricultural Bank of China (ABC) and Postal Savings Bank of China (PSBC). The original intention of establishment of the ABC is to better service "SanNong". During the commercialization reform, the institution of ABC in the countries and townships were narrowed and gradually exited the rural financial market. In 2010, ABC, as a leader of "Three Rural Finance Department" Reform, expanded the business line in county and town. By the end of 2015, 19 experiment cases (in 19 different districts) of reform had

the loan balance of 2.26 trillion yuan. It can be seen that ABC plays more and more crucial role in rural finance. PSBC was formally established in March 2007. It is a leading large-scale retailing commercial bank, which aims to serve small and medium-sized enterprises and "three-rural" issues, microfinance and rural businesses. The rural credit cooperative financial system (including rural commercial banks, rural cooperative banks and rural credit cooperatives) is the main server of formal finance in rural China. RCCs serve as one of government regulated source of rural credit providing loans to farms in China (Turvey, Xu, & Kong, 2014). To enhance the efficiency and risk management of RCCs, RCCs have gradually transformed into Rural Commercial Banks (RCBs). Here RCCs means both RCCS and RCBs. By the end of 2017, the balance of deposits and loans of the RCC were 27.2 trillion yuan and 15 trillion yuan respectively, accounting for 16.1% and 11.9% of the balance of deposits and loans of all financial institutions in the same period. The balance of loans to farmers and households were 9 trillion yuan and 4.4 trillion yuan, an increase of 9.5% and 11.6% respectively from the end of the previous year. Appling non-balanced provincial panel data of China from 1997 to 2014, Nan finds that credit from RCCs relax rural credit constraints and foster agricultural growth (Nan, Gao, & Zhou, 2019). The following table shows the number of institutions of RCC system. From the above table, it can be seen that the under the huge development of RCC system proportion of commercial finance continues to rise, and the properties of cooperative finance is weakening.

Table 3-2 Situation of RCC System

	2012	2014	2017
RCC	1927	1596	907
Rural Commercial Bank	337	665	1262
Rural Cooperative Bank	147	89	33
Village Bank	800	1153	-

Data Source: China Financial Yearbook

Mobile Banking Service is the last attribute. With the popularization of Internet and smartphone, the convenience of terminal applications has become an important factor for consumers to make choices. To adapt the tendency, almost every finance or non-finance institution explore their own application. In rural China, smartphone coverage is pretty high and mobile banking services have developed rapidly. Mobile Banking not only enables consumer to handle financial service anytime and anywhere, but also greatly enriches the meaning of traditional banking services, enabling banks to provide efficient and secure service. In addition, for household famers, reducing transaction cost and transportation cost the most appealing attraction. Given the perceived situation, we seek to determine whether mobile banking service encourage farmers to demand more loans.

Therefore, we identify six attributes with seven levels, five levels, three levels, two levels, three levels and two levels respectively. The following table shows the detail and whole picture of attributes and levels.

Table 3-3 Attributes and levels of discrete choice experiment

Attributes	Level						
Interest Rate	2%	4%	6%	8%	10%	12%	14%
Term of Loan	Less than six months	Six months to one year		One year to three years	Three years to five years		Longer than five years
Type of loan	Collateral Loan			Guaranteed Loan		Credit Loan	
Type of repayment	Pay off at one				Amortization		
Type of Institution	Rural Credit Cooperatives			Agricultural Bank of China		Postal Savings Bank of China	
Mobile Banking	Yes				No		

3.1.2 Create the experiment design

We ran two discrete choice experiments for credit demand research in rural China. The first experiment was implemented in May 2018 in three provinces within assistance of Sichuan Agricultural University, Northwest Agricultural and Forestry University, Shandong University of Finance and Economics and Central University of Finance and Economics. After collecting and primarily processing data, we design a second experiment in October 2018 in two provinces with help of from Nanjing Agricultural University, ZheJiang University and Shandong University of Finance and Economics.

In the discrete choice experiment, we use D-optimal design in the first experiment and Bayesian D-optimal design in the second experiment. The technical details of D-optimal design are provided in detail in Chapter 4.

In the first Discrete Choice Experiment on credit in Shandong, Sichuan and Shaanxi provinces in China, there are six attributes with five, seven, three, two, three and two levels separately. Therefore, there should be 1260 combination totally. We decide to apply D-optimal method to design the experiment instead of factorial method which requires too many runs for the amount of resources and time. D-optimal design matrices

are usually not orthogonal. D-optimal designs are straight optimizations based on a chosen optimality criterion and the model that will be fit.

In order to fit an optimally criterion, we define the number of the experiments we want to have in the design. The sole rule to defining the number is that it should be larger than the number of coefficients. After taking the resources and practical situation into consideration, we decided to run 120 combination and 3600 observations on credit experiments. In JMP, we design the first experiment with six attributes, ten versions of survey, six choice sets per survey, two profiles per choice. One of the cards is as follows:

	Loan1	Loan2
Interest Rate	8%	10%
Term of Loan	5-30 Year	3-5 Year
Type of Lan	Guaranteed Loan	Credit Loan
Type of Repayment	Pay off at once	Amortization
Type of Institution	RCC	Commercial Bank
Mobile Banking	Yes	NO
Decision		
Level	1 2 3 4 5	

Figure 3-3 Card of first experiment

In the second experiment, we run 81 combination and 3241 observations on credit experiments. In JMP, we design the first experiment with three versions of survey, nine choice sets per survey, three profiles per choice. Two of the cards are as follows:

	LOAN ONE	LOAN TWO	LOAN THREE
Interest Rate	2% 	14% 	12% 
Term of Loan	5-30 Year 	3-5 Year 	0-0.5 Year 
Type of Loan	Collateral Loan 	Credit Loan 	Guaranteed Loan 
Type of Repayment	Amortization 	Pay off loan at once 	Pay off loan at once 
Institution	Commercial Bank 	RCC 	Postal Savings Bank of China 
Mobile Banking	Yes 	No 	No 
Decision			
Level	1 2 3 4 5		

Figure 3-4 Card of second experiment

	LOAN ONE	LOAN TWO	LOAN THREE
Interest Rate	12% 	14% 	6% 
Term of Loan	3-5 Year 	0-0.5 Year 	1-3 Year 
Type of Loan	Collateral Loan 	Guaranteed Loan 	Credit Loan 
Type of Repayment	Pay off Loan at once 	Amortization 	Pay off Loan at once 
Institution	Postal Savings Bank of China 	RCC 	Commercial Bank 
Mobile Banking	Yes 	No 	No 
Decision			
Level	1 2 3 4 5		

Figure 3-5 Another Card of second experiment

3.1.3 Survey Design

To support the discrete choice experiment and complete the whole story of rural credit, we also create survey design. The whole questionnaire consists of four sections: farm characteristics, farm risk attitude and credit demand.

There are 20 questions in farm characteristics section concerning basic information including family characteristics, farm activities and respondents' economical level. From the section, economic level of sample can be indicated, which could provide to

some extent an explanation for the result of discrete choice experiment and compare the sample from different provinces. In a risk attitude section, the questions are divided into two parts: source of risk and risk perception and precautionary savings. Risk perception and risk undertaking ability of farmer household are measured through this section. Basically, credit activities have close relationship with risk attitudes of farmer. The third part are some specific questions about credit demand. In this part, we collect data of respondents' credit history, asset information and willing to participate in credit.

3.1.4 Implement of Discrete Choice Experiment

As explained above, we did two experiments totally. In our first experiment, we choose three different provinces in rural China. There are local universities and research teams in these three provinces. In each province, there are one professor with around twenty students. After training students, they were familiar with underlying logic of surveys and cards. Then we spent two-three days in doing field experiment in each province. Except the reason that we could get local assistance of universities and professors, we choose these three provinces for some other reasons. The following table is the basic information of three provinces.

Table 3-4 Situation of experiment areas

	Area	Population (million)	Location	GDP (billion)	Agricultural Industry	Agricultural Loan-balance(trillion)	Percentage /total loan
Shandong	157,100.0	100.1	Eastern	7,267.8	487.7	2,469.0	8.74%
Sichuan	48,600.0	83.4	Southwest	3,698.0	428.3	1,520.0	5.38%
Shaanxi	20,560.0	38.6	Northwest	2,190.0	174.0	586.0	2.07%

Data Source: Public Data

From the above the table, we select three provinces with totally distinct location and economical properties. Shandong is the developed province compared with the

other two, with a large population and GDP. The absolute agricultural added value there has ranked first for many years.

The grain output of Shandong is relatively high. Wheat, corn and sweet potatoes are the three main food crops in Shandong. The agricultural loan balance in 2016 is 2,469 billion, accounting for 8.74% of the total loan balance in China, which implies a mature agricultural economics development. We select Shandong as the first location for the reason that it is a typical eastern agricultural province. We visited 2 different towns with 6 villages in Shandong. Sichuan is located in the southwest of China, the most distinguishing district of southern and western china. Agriculture there is well-formed combining modern and tradition agricultural cultivation. Rice, wheat and corn planting have obvious advantages in Sichuan because of the suitable natural condition. The agricultural loan balance of Sichuan in 2016 is 1520 trillion, taking up 5.38% of the total loan balance. As a typical agricultural province in the southwest, Sichuan is selected in this study. Experiment was run in 6 town and 15 villages in Chengdu, capital city of Chengdu. Shaanxi, northwest part of China, has the longest history. It has the lowest agricultural added value and the ratio of agriculture loan balance among the three provinces. On behalf of the traditional agricultural pattern and thinking pattern, Shaanxi is selected to run experiment. We visited 5 towns with 11 villages in Shaanxi. Through interviewing, we finally visited 100 farm household and collected 1200 combinations in each province.

To support the first experiment and improve the choice experiment based on the data collected from the first trial, we ran a second experiment in October 2018. In the second experiment, we chose two provinces different from the first trial. Jiangsu and

Henan were selected to run the experiment. Jiangsu is located in east of china with population of 80.29 million. At the end of 2017, GDP of Jiangsu amounted to 8,059.1 billion, continue to be the first GDP province in China. Jiangsu was selected to do the experiment because it is a leading province in land transfer and land property reform. At the central of China, Henan is a traditional agricultural and populous province. At the end of 2018, GDP of Henan was 4806 billion yuan and agricultural added value was 429 billion yuan. Henan is one of the most important agricultural planting area in China. The output of grain, wheat, sesame production ranks first in many years. It is necessary to satisfy the credit demand of farm household in Henan to expand agricultural production and explore their potential in agricultural industry. The experiment was done in 21 villages and 10 villages in Jiangsu and Henan respectively. In each province, we interviewed 60 farm household and collected 1620 combinations.

3.2 Data Description

3.2.1 Basic Information

In the two discrete choice experiments, we ran experiments in rural China and visited 100 farm households in three provinces and 60 farms in two provinces. The following table provides the basic information including family characteristics and income-level description of the respondents.

Table 3-5 Data Description of First Experiment

Variable	Mean					Min					Max				
Province	SD	SC	SX	JS	HN	SD	SC	SX	JS	HN	SD	SC	SX	JS	HN
Age	53.5	55.1	60.0	53.7	50.6	22.0	30.0	30.0	30.0	28.0	76.0	83.0	82.0	83.0	72.0
Total number of household	4.0	4.4	4.4	4.6	4.8	1.0	1.0	1.0	1.0	1.0	10.0	14.0	10.0	7.0	8.0
Number of farmers	1.8	1.6	1.7	-	-	0.0	0.0	0.0	-	-	4.0	6.0	4.0	-	-
Number of workers	1.1	1.5	1.6	-	-	0.0	0.0	0.0	-	-	4.0	12.0	8.0	-	-
Years engaged in Agr	30.3	29.5	37.7	-	-	0.0	0.0	0.0	-	-	60.0	70.0	60.0	-	-
Area of Contracting Land	8.3	7.6	5.0	9.7	6.7	2.0	0.0	0.4	0.0	0.0	48.0	230.0	12.0	30.0	50.0
Transferred Land for Agr	17.7	29.76	0.1	97.3	0.5	-10.5	-8.0	-8.0	-16.0	-6.0	400.0	490.0	15.0	760.0	10.0
Agricultural Income	41.3	141.1	7.0	**302.9**	10.5	0.0	0.0	0.0	0.0	0.0	500.0	4100.0	302.8	3,68.0	86.0
Non-Agricultural Income	46.1	65.7	39.4	50.6	34.7	0.0	0.0	0.0	0.0	0.0	153.0	847.0	150.0	175.0	150.0
Total Revenue	87.5	206.8	46.3	**353.5**	45.2	2.6	0.0	2.0	170.0	30.0	500.0	3500.0	303.2	3,763.0	153.0
Production Expenditure	36.6	84.0	4.8	**187.1**	4.9	0.0	0.0	0.0	0.0	0.00	1500.0	1650.0	272.2	1,200.0	20.0
Consuming Expenditure	21.3	25.0	22.6	**42.7**	14.8	1.2	0.0	1.3	3.0	0.2	60.0	300.0	70.0	150.0	60.0
Other Expenditure	4.9	9.4	4.4	**13.8**	12.5	0.0	0.0	0.0	0.0	0.00	40.0	100.0	108.8	60.0	400.0
Income Surplus	24.6	88.5	14.6	**109.7**	5.9	-1200.0	-300.0	-33.3	-50.0	-389.0	219.0	18600.0	108.9	3393.0	430.0

Agricultural Income, Non-Agricultural Income, Total Revenue, Production Expenditure, Consuming Expenditure, Other Expenditure, Income Surplus are in thousands

Table 3-5 implies that age, total number of households, number of farmers, number of works, years engaged in agriculture of farm household in five provinces are similar with slight difference. The average age of respondents in five provinces are: 53.5, 55.1, 60.0, 53.7, 50.6. The average number of people in household in five provinces are: 4.0, 4.4, 4.4, 4.6, 4.8. The average area of contracting land in five provinces are: 8.3, 7.6, 5.0, 9.7, 6.7. However, the size of land transfer, family income and expenditure are different to a large extent. The area (mu) of transferred land for agriculture in five provinces are: 17.7, 29.76, 0.1, 97.3, 0.5, which indicates that Shaanxi has smallest area of transferring land and area of transferring land are largest in Jiangsu. Among five provinces, farmers in Jiangsu have much higher income including agricultural and non-agricultural as well as family expenditure, while Henan's farmers are relatively poor.

3.2.2 Credit information

In the first experiment, 56 respondents had credit demand while 244 respondents had no demand on loan. There were 119 farmers with credit history while 181 didn't have. Specifically, there have slight difference among three provinces. As below table 4-6, credit demand in Shaanxi is a little bit higher than that in Shandong and Sichuan. However, the proportion of farmers with credit history in three provinces are of huge difference. Farmers in Shaanxi with credit history is four times more than that in Shandong and two times more than that in Sichuan.

As for the familiarity with credit, most farm households know credit more or less. In Shandong and Sichuan, most farmers know a little about the credit policy and basic credit information. During the survey, we encourage interviewees to image what are their possible purpose to apply credit if they could get loans without limitation. From

the data in the following table, agricultural production, medical expenses are the main uses to apply credit. Half of farm household in Shandong and Sichuan are willing to get a loan from financial institutions, the other half would like to borrow from informal institutions including friends and relatives. In Shaanxi, however, two thirds of the respondents prefer to apply credit from formal financial institution.

Table 3-6 Credit Data Description

		Shandong	Sichuan	Shaanxi
Credit Demand	Have credit demand	18	17	21
	No credit demand	82	17	79
Credit History	Have credit history	17	36	66
	No credit history	83	64	34
Knowledge of Credit	Never heard about	6	4	1
	Know a little	54	60	33
	Know a lot	22	15	28
	Be familiar with	18	21	38
Credit Purpose (Multiple Choice)	Agricultural production	27	40	26
	House construction/renovation	16	32	20
	Purchase of car/motorcycle/bicycle	12	6	4
	Household consumption	5	6	7
	Medical expenses	26	27	42
	Education expenses	3	10	6
Preferred Credit Source	Informal institution	46	58	33
	Formal financial institution	54	42	67
	Other	0	0	0

3.2.3 Education level and credit demand

The education level of farmers can generally be divided into none education experience, primary, junior high school, high school, college and graduate. The education level of farm household can reflect the potential capacity of production or making life to some extent. Table 3-7 implies that farm households in Shaanxi have higher education level because of the large portion of high and college degree.

Meanwhile Sichuan's respondents have lower education level. For the whole three provinces, majority of farmers have education level lower than college level.

Table 3-7 Education Level Distribution of sample

	None	Primary	Junior High	High	College	Graduate
Shandong	1	22	60	14	2	1
Sichuan	8	34	33	19	6	0
Shaanxi	1	22	63	12	2	0

To understand how education level affect credit demand behavior, we classify credit demand, credit history, knowledge of credit, credit purpose, preferred credit source into six categories according to education level as table 3-8.

Table 3-8 Education level and Credit Behavior in Shandong

Province	Credit		None	Primary	Junior High	High	College	Graduate
Shandong	Credit Demand	Have credit demand	5.56%	11.11%	61.11%	11.11%	5.56%	5.56%
		No credit demand	0.00%	24.39%	59.76%	14.63%	1.22%	0.00%
	Credit History	Have credit history	5.88%	0.00%	52.94%	23.53%	11.76%	5.88%
		No credit history	0.00%	25.30%	60.24%	13.25%	1.20%	0.00%
	Knowledge of Credit	Never heard about	16.67%	33.33%	50.00%	0.00%	0.00%	0.00%
		Know a little	0.00%	29.63%	59.26%	11.11%	0.00%	0.00%
		Know a lot	0.00%	13.64%	68.18%	18.18%	0.00%	0.00%
		Be familiar with	0.00%	5.56%	55.56%	22.22%	11.11%	5.56%
	Credit Purpose (Multiple Choice)	Agricultural production	7.41%	3.70%	70.37%	14.81%	3.70%	0.00%
		House construction/renovation	0.00%	25.00%	43.75%	18.75%	6.25%	6.25%
		Purchase of car/motorcycle/bicycle	0.00%	8.33%	58.33%	16.67%	8.33%	8.33%
		Household consumption	0.00%	20.00%	60.00%	0.00%	20.00%	0.00%
		Medical expenses	3.85%	26.92%	53.85%	15.38%	0.00%	0.00%
		Education expenses	0.00%	0.00%	33.33%	66.67%	0.00%	0.00%
	Preferred Credit Source	Friends and Relatives	2.17%	34.78%	52.17%	8.70%	2.17%	0.00%
		Formal financial institution	0.00%	11.11%	66.67%	18.52%	1.85%	1.85%

Table 3-9 Education level and Credit Behavior in Sichuan

Province	Credit		None	Primary	Junior High	High	College	Graduate
Sichuan	Credit Demand	Have credit demand	15.79%	10.53%	31.58%	26.32%	15.79%	0.00%
		No credit demand	6.17%	39.51%	33.33%	17.28%	3.70%	0.00%
	Credit History	Have credit history	11.11%	22.22%	41.67%	16.67%	8.33%	0.00%
		No credit history	6.25%	40.63%	28.13%	20.31%	4.69%	0.00%
	Knowledge of Credit	Never heard about	25.00%	25.00%	25.00%	25.00%	0.00%	0.00%
		Know a little	8.33%	45.00%	30.00%	13.33%	3.33%	0.00%
		Know a lot	6.67%	20.00%	40.00%	26.67%	6.67%	0.00%
		Be familiar with	4.76%	14.29%	38.10%	28.57%	14.29%	0.00%
	Credit Purpose (Multiple Choice)	Agricultural production	2.50%	20.00%	37.50%	27.50%	12.50%	0.00%
		House construction/renovation	12.50%	40.63%	31.25%	3.13%	12.50%	0.00%
		Purchase of car/motorcycle/bicycle	0.00%	60.00%	40.00%	0.00%	0.00%	0.00%
		Household consumption	16.67%	50.00%	33.34%	0.00%	0.00%	0.00%
		Medical expenses	3.70%	37.04%	37.04%	18.52%	3.70%	0.00%
		Education expenses	20.00%	20.00%	30.00%	30.00%	0.00%	0.00%
	Preferred Credit Source	Friends and Relatives	12.07%	41.38%	29.31%	8.62%	8.62%	0.00%
		Formal financial institution	2.38%	23.81%	40.48%	30.95%	2.38%	0.00%

Table 3-10 Education level and Credit Behavior in Shaanxi

Province	Credit		None	Primary	Junior High	High	College	Graduate
Shaanxi	Credit Demand	Have credit demand	0.00%	14.29%	76.19%	9.52%	0.00%	0.00%
		No credit demand	1.27%	24.05%	59.49%	12.66%	2.53%	0.00%
	Credit History	Have credit history	1.52%	15.15%	69.70%	12.12%	1.52%	0.00%
		No credit history	0.00%	35.29%	50.00%	11.76%	2.94%	0.00%
	Knowledge of Credit	Never heard about	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
		Know a little	3.03%	33.33%	54.55%	9.09%	0.00%	0.00%
		Know a lot	0.00%	17.86%	64.29%	14.29%	3.57%	0.00%
		Be familiar with	0.00%	15.79%	68.42%	13.16%	2.63%	0.00%
	Credit Purpose (Multiple Choice)	Agricultural production	0.00%	19.23%	73.08%	7.69%	0.00%	0.00%
		House construction/renovation	5.00%	15.00%	50.00%	30.00%	0.00%	0.00%
		Purchase of car/motorcycle/bicycle	0.00%	25.00%	75.00%	0.00%	0.00%	0.00%
		Household consumption	0.00%	14.29%	57.14%	28.57%	0.00%	0.00%
		Medical expenses	2.38%	23.81%	57.14%	16.67%	0.00%	0.00%
		Education expenses	0.00%	16.67%	66.67%	16.67%	0.00%	0.00%
	Preferred Credit Source	Friends and Relatives	3.03%	24.24%	54.55%	15.15%	3.03%	0.00%
		Formal financial institution	0.00%	20.90%	67.16%	10.45%	1.49%	0.00%

In Shandong, Sichuan and Shaanxi, the percentage of farmers with junior high level are high in every aspect because farmers graduated from junior high takes up majority. Education level has little influence on credit demand in Shandong and Sichuan while it impacts farmers' credit demand and history in Shaanxi. The higher education level the farmers have, the higher awareness of credit. In terms of the credit purpose, farmer with relatively lower education level use the credit loan in house construction/renovation, household consumption whereas farmers with higher education level tend to apply credit on agricultural production and education in previous two provinces. In Shaanxi, however, it does not play a distinct role for farmers in purpose of loan. As for credit source, farmers which is well-educated are willing to get loan from formal financial institution.

3.2.4 Agriculture Insurance and credit demand

Agricultural insurance is policy insurance which is subsided by government in rural China. Table 3-11 shows that agriculture insurance coverage is higher in Shandong and lower in Shaanxi. Farmers with agriculture insurance generally have higher credit demand. However, the difference between with insurance and without insurance is slight.

Table 3-11 Credit Demand and Agriculture Insurance

Province	Credit Demand	Has Agriculture Insurance	No Agricultural Insurance
Shandong	Has Credit Demand	94.44%	5.56%
	No Credit Demand	96.34%	3.66%
Sichuan	Has Credit Demand	64.71%	35.29%
	No Credit Demand	61.45%	38.55%
Shaanxi	Has Credit Demand	85.71%	14.29%
	No Credit Demand	78.48%	21.52%

3.3 Summary

Chapter three describes experiments implementation including four steps. With the assistance of Chinese local universities, professors and students, we successfully ran two experiments in five provinces. We collect 120 combination, 3600 observations and 300 surveys in first experiment, 81 combination, 3241 observations and 120 surveys in second experiment. Simple statistical description is shown in chapter four which provides foundation of econometric analysis for the next chapter.

CHAPTER 4

METHODOLOGY

In the previous chapter I presented the steps and reasoning behind the discrete choice experiment as implemented in-the-field in China. In this chapter I outline the econometric techniques used to analyze this data. Underlying the choice experiment is the notion of 'random utility'. The random utility model provides several mechanisms to investigate experimental designs, including conditional and mixed Logit models. This chapter reviews random utility theory, and uses this to justify the use of conditional and or mixed Logit models as the core econometric approach to investigating choice experiments. The regression results and measures of willingness to pay will be presented in the next chapter.

4.1 Random Utility Theory

In this study, a mixed random parameter multinomial Logit (MMNL) model is adopted to modeling for credit decision of farm households.

A product (a credit decision in this study) is a bundle of attributes, and utilities are derived from the bundle of attributes rather than the product as a whole. Random utility theory can be used as a theoretical framework to analyze consumer choice (McFadden & Zarembka, 1974)In an n-choice situation (n = 1, 2, or 3), consumer i's utility (U_{ni}) can be modeled as a linear function of product attributes (X_{nj}):

$$U_{nj} = V_{nj} + \varepsilon_{nj} = X_{nj}\beta + \varepsilon_{nj} \qquad 4\text{-}1$$

This is a Logit Model, which is also called "Random Utility Model", where β is a vector of unknown part-worth utilities associated with attribute X_{nj}. The deterministic part, V_{nj} is parameterized by β, which allows us to estimate the effect of the variable,

X_{nj} on utility. The random error term ε_{nj} reflects the fact that decision makers are going to prefer different alternatives given that they prefer the attributes of each alternative differently.

The probability that decision maker n selects alternatives i is:

$$\begin{aligned} p_{ni} &= prob\left(U_{ni} > U_{nj}, \forall j \neq i\right) \\ &= prob\left(V_{ni} + \varepsilon_{ni} > V_{nj} + \varepsilon_{nj}, \forall j \neq i\right) \\ &= prob\left(\varepsilon_{nj} - \varepsilon_{ni} < V_{ni} - V_{nj}, \forall j \neq i\right) \\ &= \int I\left(\varepsilon_{nj} - \varepsilon_{ni} < V_{ni} - V_{nj}, \forall j \neq i\right) f(\varepsilon_n) d\varepsilon_n \end{aligned} \quad 4\text{-}2$$

if $\varepsilon_{nj} \sim iid\ EV$, the choice probability p_{ni} is

$$p_{ni} = \frac{exp(V_{ni})}{\sum_{j=1}^{J} exp(V_{nj})} \quad 4\text{-}3$$

The above Logit is conditional Logit, which means attribute x_{nj} it is decided by both of individuals and alternatives and random utility caused by x_{nj} does not depend on alternatives j. To be specific, the choice probability can be written as $\mathrm{p}\left(y_j = j \middle| x_{nj}\right)$ because it is a conditional probability. The assumption of the conditional Logit model implies that the unobserved factors are uncorrelated over alternatives, as well as having the same variance for all alternatives.

McFadden and Train (2002) developed the mixed Logit model, they show that a mixed Logit can approximate any Logit model. The fundamental idea behind the mixed Logit model is the utility from any one choice is no longer independent of any other choice, but rather correlated through the introduction. Generally, a mixed Logit model contains two sections: a Logit speciation of an individual's probability of choosing a given alternative; a specification of the distribution of the utility (Train, 2016).

The mixed Logit is:

$$U_{nj} = V_{nj} + \varepsilon_{nj} = \beta_n X_{nj} + \varepsilon_{nj} \quad 4\text{-}4$$

The only difference between the conditional Logit model and mixed Logit model is that the response parameter varies over decision makers n. In a Mixed Logit model, elements in vector β are defined as random variables following density function:$\beta_n \sim f(\beta_0, G)$ where β_0 is are the means of β_n, and G is the variance matrix. In this study, we assume that β_n are distributed normally: $\beta_n \sim N(\overline{\beta}, \sigma_\beta)$.

$$p_{ni} = \int \frac{exp(\beta_n x_i)}{\sum_{j=1}^{J} exp(\beta_n x_j)} f(\beta) d\beta \quad 4\text{-}5$$

McFadden and Train have shown that a mixed Logit model can, under benign conditions, approximate any choice model to any degree of accuracy (McFadden & Train, 2000). Thus, we choose mixed Logit in this study. The utility function in this study is:

$$U_{ni} = V_{ni} + \varepsilon_{ni} = \beta_n X_{ni} + \varepsilon_{ni} \quad 4\text{-}6$$

where

n is the farm households

i is decision of credit product

x consists of the following variables: Interest Rate, Term of Loan, Credit Loan, Guaranteed Loan, Amortization, RCC, PSBC, Mobile Banking (We will explain this in chapter four).

4.2 Discrete Choice Experiment

According to Hanemann (1984), consumer decisions can be separated into discrete and continuous choice. To better depict discrete choice of farm household when they make a decision for credit product, this study applies Discrete Choice Experiment. Discrete Choice Experiments (DCEs) was first put forward by Louviere and Hensher (1982) and then was gradually completed and applied in psychology, economics with random utility theory, and environmental valuation.

A discrete choice experiment (DCE) allows us to collect choice data. There are several choice situations in the experiment. A collection of attributes is a production alternative (profile). Respondents in experiments choose one of the alternatives. DCE involve people comparing prospective products and picking up their preferred one. Each choice alternative is defined by a set of attributes, each attribute takes at least one levels. Respondents' choices (decisions) imply implicit trade-offs between the levels of the attributes in the different alternatives included in a choice set. The purpose of DCE is to define a product that people want to buy. When cost or price is included in attributes, willingness-to-pay (WTP) can be calculated.

In a factorial design, all possible combinations of the levels of the factors are investigated in each replication. However, it is also unrealistic. Efficiency is a measure of the level of precision in which effects are estimated. Factorial designs are most efficient for this type of experiment. According to Street et al. (2005) Various efficiency criteria have been proposed, such as A-error or D-error. The D-error has become the most widely used measure of efficiency because of its insensitivity to the magnitude of the scale of the parameters. Although the inclusion of a status quo option may reduce

efficiency, as mentioned before, it should be included on the grounds of better congruency with consumer theory and real choices. Consequently, there may be a trade-off between optimality and plausibility. It is clear that from a statistical perspective, optimal design is desirable, but from an empirical perspective some other issues need to be taken into account, such as task complexity, heuristics or the inclusion of a base scenario or status quo option (Lancsar, & Louviere 2008).

As discussed in Chapter 3, We ran two discrete choice experiments for credit demand research in rural China. The first experiment was implemented in May 2018 in three. After collecting and primarily processing data, we design a second experiment in October 2018 in two provinces. In the two discrete choice experiments, to select the best combination we use a criterion. We use D-optimal design in the first experiment and Bayesian D-optimal design in the second experiment.

We decide to apply D-optimal method to design the experiment instead of factorial method which requires many runs for the amount of resources and time. D-optimal design matrices are usually not orthogonal. D-optimal designs are straight optimizations based on a chosen optimality criterion and the model that will be fit.

The optimality criterion used in D-optimal designs is maximizing the determinant of $|A^TA|$, the determinant of the information matrix A^TA. The rows of $A = [a_1, a_2, \dots a_q]^T$ are chosen from M possible tests vectors $u_i \in R^P, i = 1, \dots M$ which are known in advance. Then,$a_i \in \{u_1, \dots u_M\}, i = 1, \dots, q$. Matix A is made up of these test vectors u_i, the matrix A^TA can be written as:

$$A = q \sum_{i=1}^{M} \lambda_i u_i {u_i}^T \qquad 4\text{-}7$$

where λ_i is the fraction of rows in A that are equal to the vector u_i.

The D-optimal experiment design can be written as a minimum determined problem (Triefenbach, 2008)

$$\begin{aligned} &minimize\ \lambda \quad log\ det \quad \left(\sum_{i=1}^{M} \lambda_i u_i {u_i}^T\right)^{-1} \\ &subject\ to\ \lambda_i \geq 0,\ \sum_{i=1}^{M} \lambda_i = 1 \quad i = 1, \ldots, m \end{aligned} \tag{4-8}$$

D-optimal design is model-dependent which means if we change model, another matrix and information matrix will be calculated. In this case, we choose linear mode, which means a combination of a coefficient β_i and a factor x_i.

Based on information of first experiment, we apply Bayesian D-optimal design in second experiment. Sándor and Wedel introduced Bayesian D-optimal design models that are ideally suited to deal with model uncertainty (Sndro & Wedel, 2001). As this method incorporate all prior information which would lower the standard errors and could reduce sample size, Bayesian D-optimal design takes advantage over D-optimal design (Hoyos, 2010). Bayesian D-optimal design usually requires a distribution $p(\beta)$ for the unknown parameter β, the distribution of response, given the unknown parametersβ, p $p(y|\beta)$, a utility function of the form $U(\text{choice}, \beta, \xi, y)$. For design ξ, the expected utility of the choice is

$$U(\xi) = \int_y max \int_\beta U(choice, \beta, \xi, y)\ p(\beta|\xi) d\beta dy \tag{4-9}$$

The Bayesian D-optimal design ξ_x maximize the expected utility: $\xi_x = \max U(\xi)$ (Jones & Lin, 2008).

4.3 Summary

In this chapter I reviewed the random utility model and related conditional and mixed Logit models. The proposed econometric technique is used to investigate the results from the choice experiment as described in Chapter 3. Combined, these methodologies are the core part of designing experiment and analyzing data. As seen in figure 4-1, we apply D-optimal design as used in the first experiment and Bayesian D-optimal design in second experiment. After comparing conditional Logit and mixed Logit model, we finally choose mixed Logit to explain the data. In the next step, we mainly introduce how to do the experiment using D-optimal design.

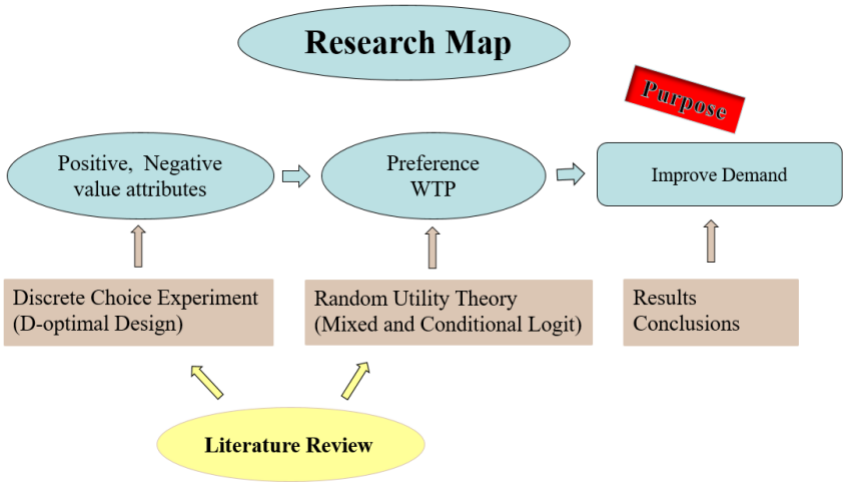

Figure 4-1 Research Map

CHAPTER 5

EMPIRICAL RESULTS

After field experiments implementation and simple data description, chapter five focus on analyzing data from discrete choice experiment. As discussed in chapter three, we ran mixed Logit model and conditional Logit model for two experiments and five provinces separately. Chapter five aims to estimate utility function parameters and calculate willingness to pay of farmers for credit.

5.1 Logit Results

After design and implement of discrete choice experiment, we interviewed 300 farm households in the first experiment and 120 farm households in the second experiment and finally collected 3600 combinations and 3240 combinations (as explained in chapter three and chapter four). Following Table 5-1 presents conditional Logit and mixed Logit results from first and second experiments.

Table 5-1 Utility Function Parameter Estimate of First and Second Experiment

	Mixed Logit				Conditional Logit	
	First Experiment		Second Experiment		First Experiment	Second Experiment
VARIABLES	Mean	SD	Mean	SD		
InterestRate	-0.3739***		-0.5267***		-0.2925***	-0.4980***
	0.0301		0.0282		0.02	0.0252
TermofLoan	0.0936**	0.3877***	0.2598***	0.1672***	0.0599**	0.2458***
	0.04	0.06	0.04	0.05	0.0248	0.0327
GuaranteedLoan	0.0762	-0.6348***	0.1616	0.1276	0.0684	0.1856*
	0.1141	0.1495	0.1046	0.1587	0.0887	0.0969
CreditLoan	0.5900***	0.1531	0.4776***	0.3200***	0.4994***	0.4772***
	0.1165	0.3162	0.1041	0.1221	0.0943	0.0916
Amortization	0.5945***	-0.8703***	0.3842***	0.5244***	0.4534***	0.3524***
	0.1121	0.1905	0.1048	0.1136	0.0746	0.0734
RCC	0.2952***	-0.3752	-0.0833	-0.1878	0.1984***	-0.0533
	0.0936	0.2522	0.1078	0.1681	0.0719	0.0937
PSBC	0.2759**	-0.3205	-0.1025	0.0036	0.2081**	-0.081
	0.1141	0.302	0.0976	0.329	0.0899	0.0898
MobileBanking	0.0157	0.1505	-0.3548***	-0.0239	0.0286	-0.3326***
	0.329	0.0849	0.3952	0.0825	0.0707	0.0747
Log Likelihood	-1036.9567		-847.00484		-1060.15	-855.6888
AIC	2103.913		1724.01		2136.303	1727.378
BIC	2196.576		1815.26		2185.723	1776.044
Observations	3,600	3,600	3,240	3,240	3,600	3240

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

The coefficients estimated with a conditional Logit model in first experiment and second experiment are shown in Table 5-1, which underlies the following utility functions.

$$Utility_{ijn} = \underset{(0.02)}{-0.2925} * InterestRate_{ijn} + \underset{(0.0248)}{0.0684} * TermofLoan_{ijn} + \underset{(0.0887)}{0.284} * \text{GuaranteedLoan}_{ijn}$$
$$+\underset{(0.0943)}{0.4994} * \text{CreditLoan}_{ijn} + \underset{(0.0746)}{0.4534} * Amortization_{ijn} + \underset{(0.0719)}{0.1984} * \text{RCC}_{ijn}$$
$$\underset{(0.0899)}{0.2081} * PSBC_{ijn} + \underset{(0.0707)}{0.0286} * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}1$$

$$Utility_{ijn} = \underset{(0.0252)}{-0.4980} * InterestRate_{ijn} + \underset{(0.0327)}{0.2458} * TermofLoan_{ijn} + \underset{(0.0969)}{0.185} * \text{GuaranteedLoan}_{ijn}$$
$$+\underset{(0.0916)}{0.4772} * \text{CreditLoan}_{ijn} + \underset{(0.0734)}{0.3524} * Amortization_{ijn} - \underset{(0.0937)}{0.0533} * \text{RCC}_{ijn}$$
$$\underset{(0.0898)}{-0.081} * PSBC_{ijn} - \underset{(0.0747)}{0.3326} * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}2$$

where i represents farmers identifier, j represents the alternative that is chosen, and n represents choice situation. As is shown in the Table 5-1, all the parameters are significant except for mobile banking in the first experiment and except Institution in the second experiment. The coefficients reflect utility of the attributes of different alternatives.

The coefficients estimated with a mixed Logit model in first experiment and second experiment are shown in Table 5-1, which derives from the following functions:

$$Utility_{ijn} = \underset{(0.0301)}{-0.3739} * InterestRate_{ijn} + \underset{(0.04)}{0.0936} * TermofLoan_{ijn} + \underset{(0.1141)}{0.076} * \text{GuaranteedLoan}_{ijn}$$
$$+\underset{(0.1165)}{0.5900} * \text{CreditLoan}_{ijn} + \underset{(0.1121)}{0.5945} * Amortization_{ijn} + \underset{(0.0936)}{0.2952} * \text{RCC}_{ijn}$$
$$+\underset{(0.1141)}{0.27591} * PSBC_{ijn} + \underset{(0.329)}{0.0157} * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}3$$

$$Utility_{ijn} = \underset{(0.0282)}{-0.5267} * InterestRate_{ijn} + \underset{(0.04)}{0.2598} * TermofLoan_{ijn} + \underset{(0.1046)}{0.162} * \text{GuaranteedLoan}_{ijn}$$
$$+\underset{(0.1041)}{0.4776} * \text{CreditLoan}_{ijn} + \underset{(0.1048)}{0.3842} * Amortization_{ijn} - \underset{(0.1078)}{0.0833} * \text{RCC}_{ijn}$$
$$\underset{(0.0976)}{-0.1025} * PSBC_{ijn} - \underset{(0.3952)}{0.3548} * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}4$$

where i represents customer identifier, j represents the alternative that is chosen, and n represents choice situation.

In this model, we assume that the parameters estimated has normal distributions, so we could get the mean and standard deviation of the estimators shown in Table 5-1. The mixed Logit model explains the heterogeneity of different responses towards same attributes of the customers, which gives us more insights. Preference heterogeneity is revealed through estimating the standard deviation (Hensher & Rose), which implies how the valuation of the total sample spread around the estimated means.

The results are shown in Table 5-1 column 1, except for mobile banking, all the parameters are significant at the 5% confident level at least. After analyzing the parameter estimation, the following information can be inferred: the lower the interest rate and the longer the term of loan, the higher the utility farmers can get from credit; compared with collateral loan, credit loan are more preferred; amortization is more popular; three institutions are preferred by the farm households in the following sequence (from high to low): RCC (Rural Credit Cooperatives), PSBC (special financial institution), ABC (commercial bank).

Estimation of results of conditional Logit models are shown in appendix and mixed Logit models are reported in Table 5-2 and Table 5-3. Both conditional Logit and mixed Logit models are highly significant. The estimates in two models are consistent for most

of variables with significance and signs. As the mixed Logit model provides richer information about heterogeneity in individual, the following discussion will be based on mixed Logit. Standard deviation of Term of Loan, Guaranteed Loan and Amortization are significant, indicating that the valuations of these attributes are highly heterogeneous among respondents whereas the rest attributes valuation are homogeneous.

Table 5-2 Mixed Logit Results of Different Provinces

	Jiangsu		Henan		Shandong		Sichuan		Shaanxi	
VARIABLES	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
InterestRate	-0.7003***		-0.5128***		-0.3459***		-0.5312***		-0.3201***	
	0.0574		0.0415		0.0506		0.0676		0.053	
TermofLoan	0.2335***	0.2631***	0.3524***	0.3620***	0.1589**	0.2555**	0.0177	0.4579***	0.108	0.4700***
	0.0663	0.0865	0.0728	0.0776	0.0661	0.1063	0.0756	0.1187	0.0804	0.1184
GuaranteedLoan	0.2861	-0.2614	0.072	0.1966	0.0235	0.4565	0.1865	0.4849	0.0646	0.7603**
	0.1753	0.3581	0.1503	0.2678	0.1897	0.3012	0.2128	0.3783	0.2045	0.3206
CreditLoan	0.6452***	0.7613***	0.4064***	0.4620**	0.4827**	0.0493	0.5259**	0.0957	0.9395***	0.6353
	0.1868	0.2145	0.1468	0.2106	0.2024	0.4799	0.2191	0.3975	0.2354	0.403
Amortization	-0.6864***	1.4518***	0.2566*	0.5943***	0.7732***	0.8189**	0.3386	1.3318***	0.7727***	-0.0416
	0.2296	0.2431	0.1381	0.1765	0.1984	0.32	0.2268	0.3388	0.18	1.1733
RCC	-0.0708*	-0.6031***	-0.0033*	-0.1041	0.3412**	0.5566	0.198	0.1321	0.3362*	-0.575
	0.1939	0.2275	0.1476	0.1981	0.1692	0.4541	0.1661	0.3773	0.1793	0.3666
PSBC	-0.0612	-0.2537	-0.1386	-0.0071	0.3168	0.6192	0.4057*	-0.1054	0.2108	-0.2527
	0.1652	0.2456	0.143	0.2672	0.2055	0.4867	0.2139	0.3245	0.2053	0.5484
MobileBanking	-0.4544***	-0.2705	-0.3411***	-0.1435	-0.0339	-0.2173	0.2243	-0.516	-0.1104	-0.5512
	0.1474	0.1896	0.1182	0.2766	0.1488	0.3566	0.1697	0.4319	0.1652	0.3851
Log Likelihood	-383.58448		-430.7824		-338		-329.91702		-347.15222	
AIC	797.169		891.5648		706.0357		689.834		724.3044	
BIC	78.0217		972.4175		781.9042		766.1852		800.6306	
Observations	1,620	1,620	1,620	1,620	1200	1200	1,200	1,200	1,200	1,200

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table 5-3 Conditional Logit Results of Different Provinces

VARIABLES	Jiangsu Decision	Henan Decision	Shandong Decision	Sichuan Decision	Shaanxi Decision
InterestRate	-0.5473***	-0.4602***	0.1113**	-0.3761***	-0.2336***
	0.038	0.0343	0.0443	0.0368	0.0338
TermofLoan	0.1779***	0.3103***	-0.2818***	0.0071	0.0629
	0.0472	0.0458	0.035	0.0445	0.0423
GuaranteedLoan	0.2833**	0.1081	0.0261	0.1248	0.0676
	0.1427	0.1332	0.1563	0.159	0.1505
CreditLoan	0.5899***	0.3804***	0.4255**	0.3831**	0.7051***
	0.1364	0.1252	0.1657	0.1682	0.162
Amortization	-0.4746***	0.2408**	0.6378***	0.1569	0.5791***
	0.1067	0.1019	0.1337	0.1304	0.1289
RCC	-0.1743	0.0436	0.2465*	0.0884	0.2630**
	0.1392	0.1282	0.1273	0.1269	0.1247
PSBC	-0.0835	-0.0829	0.2607*	0.2648*	0.1199
	0.1286	0.1264	0.1579	0.1602	0.1536
MobileBanking	-0.4076***	-0.2798***	0.002	0.191	-0.1003
	0.1116	0.1021	0.1254	0.1247	0.1221
Log Likelihood	-408.981	-440.348	-342.21	-341.955	-358.571
AIC	833.9611	896.6969	700.4197	699.9091	733.1429
BIC	877.0826	939.8184	740.8829	740.6298	733.8502
Observations	1,620	1,620	1200	1200	1200

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

The coefficients estimated with a mixed Logit model in different provinces are shown in Table 5-2, which underlies the following linear utility function:

$$Utility_{ijn} = -0.7003 * InterestRate_{ijn} + 0.2335 * TermofLoan_{ijn} + 0.286 * \text{GuaranteedLoan}_{ijn}$$
$$(0.0574) \qquad (0.0663) \quad (0.1753)$$
$$+0.6452 * \text{CreditLoan}_{ijn} - 0.6864 * Amortization_{ijn} - 0.0708 * \text{RCC}_{ijn}$$
$$(0.1868) \qquad (0.2296) \qquad (0.1939)$$
$$-0.0612 * PSBC_{ijn} - 0.4544 * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}5$$
$$(0.1652) \qquad (0.1474)$$

$$Utility_{ijn} = -0.5128 * InterestRate_{ijn} + 0.3524 * TermofLoan_{ijn} + 0.072 * \text{GuaranteedLoan}_{ijn}$$
$$(0.0415) \qquad (0.0728) \qquad (0.1503)$$
$$+0.4064 * \text{CreditLoan}_{ijn} + 0.2566 * Amortization_{ijn} - 0.0033 * \text{RCC}_{ijn}$$
$$(0.1468) \qquad (0.1381) \qquad (0.1476)$$
$$-0.1386 * PSBC_{ijn} - 0.3411 * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}6$$
$$(0.143) \qquad (0.329)$$

$$Utility_{ijn} = -0.3459 * InterestRate_{ijn} + 0.1589 * TermofLoan_{ijn} + 0.023 * \text{GuaranteedLoan}_{ijn}$$
$$(0.0506) \qquad (0.0661) \qquad (0.1897)$$
$$+0.4827 * \text{CreditLoan}_{ijn} + 0.7732 * Amortization_{ijn} + 0.3412 * \text{RCC}_{ijn}$$
$$(0.2024) \qquad (0.1984) \qquad (0.1692)$$
$$+0.3168 * PSBC_{ijn} - 0.0339 * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}7$$
$$(0.2055) \qquad (0.1488)$$

$$Utility_{ijn} = -0.5312 * InterestRate_{ijn} + 0.0177 * TermofLoan_{ijn} + 0.186 * \text{GuaranteedLoan}_{ijn}$$
$$(0.0676) \qquad (0.0756) \qquad (0.2128)$$
$$+0.5259 * \text{CreditLoan}_{ijn} + 0.3386 * Amortization_{ijn} + 0.198 * \text{RCC}_{ijn}$$
$$(0.2191) \qquad (0.2268) \qquad (0.1661)$$
$$+0.4057 * PSBC_{ijn} + 0.2243 * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}8$$
$$(0.2139) \qquad (0.1697)$$

$$Utility_{ijn} = -0.3201 * InterestRate_{ijn} + 0.108 * TermofLoan_{ijn} + 0.0646 * \text{GuaranteedLoan}_{ijn}$$
$$(0.053) \qquad (0.0804) \qquad (0.2045)$$
$$+0.9395 * \text{CreditLoan}_{ijn} + 0.7727 * Amortization_{ijn} + 0.3362 * \text{RCC}_{ijn}$$
$$(0.2354) \qquad (0.18) \qquad (0.1793)$$
$$+0.2108 * PSBC_{ijn} - 0.1104 * MobileBanking_{ijn} + \varepsilon_{ijn} \qquad 5\text{-}9$$
$$(0.2053) \qquad (0.1652)$$

where i represents customer id, j represents the alternative that is chosen, and n represents choice situation.

In Shandong, as is shown in table 5-2, all the parameters are significant at least at 5% level except mobile banking attribute. The coefficient of interest rate in five provinces are significant at 1% level and the coefficients are negative, which is consistent with classical economic theory, implying a downward sloping demand curve. Compared with farm household in Shaanxi and Henan, Jiangsu's famers are more preferred to low interest rate.

The coefficient of term of Loan in all provinces are significant at different level except coefficient in Shaanxi. The coefficients of term are positive, indicating that consumers (farm households) are reluctant to sign shorter contracts with all other factors unchanged. This may be resulted from aversion to risk. The effect of term of loan on credit demand is marginal in Sichuan.

The coefficients of type of loan in five provinces are similar to some extent. The coefficient of guaranteed loan in five provinces are not significant, which means it does not matter when people make choice. As the baseline is collateral loan, we can see from the estimation that credit loans are more preferred by the farm households than collateral loan because the coefficient of credit loan are positive and significant. This may due to the low transaction cost of credit loan. Collateral loan is always the last one to choose because it usually requires house property or land property registration and other procedures, which makes huge commission fee.

The coefficients of amortization are significant. In Jiangsu, the sign of the coefficient is negative, indicating that farmers here are willing to pay off the loan at once. The survey data indicating that economical-level and credit knowledge are pretty high in Jiangsu. Due to the economic level, they have the capacity and are willing to

pay-off quickly to apply the next round of credit loan. Their loans are mainly used in agricultural production and house construction/renovation. The coefficients of amortization in the other four provinces are positive. Compared with the baseline (pay off at once), they prefer amortization.

The coefficients of RCC in Jiangsu and Henan are negative and significant at 10% confident level. As the baseline is Agricultural Bank of China (Commercial Bank), the estimation shows that farmers prefer Agricultural Bank of China (Commercial Bank). The coefficient of RCC in Shaanxi is positive and significant, indicating that people in Shaanxi tend to choose RCC as the source of their loan. The coefficient of PSBC reflects that farmers in Sichuan are willing to choose PSBC as the source of their loan, compared with Agricultural Bank of China.

Mobile Banking has effect only in Jiangsu and Henan. The negative sign indicates farmers in these two provinces are reluctant to choose mobile banking service. The coefficients of Mobile Banking in Shandong, Sichuan and Shaanxi are insignificant, indicates that mobile banking services are not valued.

5.2 Willingness to Pay

Willingness to Pay is applied to measure the change in interest rate associated with a unit change in the attribute (Louviere & Hensher, 1982). The function is:

$$WTP_i = -\frac{\beta_i}{\beta_{interest\ rate}} \qquad 5\text{-}10$$

wher β_i is the estimate for attribute i, $\beta_{interest\ rate}$ is the estimate for interest rate in mixed Logit model.

In the mixed Logit model, we keep the coefficient for interest rate fixed. Fixed interest rate makes it easier to calculate the distribution of willingness to pay (WTP) for each non-interest rate attribute. When the interest rate coefficient is random, the distribution of WTP is the ratio of two distributions, which is harder to work with. However, if the interest rate is fixed, the distribution of WTP for an attribute has the same distribution as the attribute's coefficient.

We use the estimated mean coefficients to determine the amount that a farmer with average coefficients for interest rate is willing to pay for other parameters.

Table 5-4 Willing to Pay

	Jiangsu	Henan	Shandong	Sichuan	Shaanxi
TermofLoan	0.33343	0.68721	0.4593813	0.03332	0.33739
GuaranteedLoan	0.40854	0.14041	0.0679387	0.35109	0.20181
CreditLoan	0.92132	0.79251	1.39549	0.99002	2.93502
Amortization	-0.9802	0.50039	2.2353281	0.63742	2.41393
RCC	-0.1011	-0.0064	0.9864123	0.37274	1.0503
PSBC	-0.0874	-0.2703	0.9158716	0.76374	0.65854
MobileBanking	-0.6489	-0.6652	-0.098005	0.42225	-0.3449

The calculated mean WTP measures are presented in Table 5-3, they are calculated from the empirical distributions, from which standard errors and confidence intervals were estimated. The surveyed farmers valued term of loan, and were willing to pay a sizeable premium for longer term of loan, ranging from 0.33 to 0.69. As for the type of loan, farmers in five provinces would add an extra 0.41, 0.14, 0.68, 0.35 and 0.20 respectively to the interest rate for guaranteed loan. The WTP estimates for credit loan are high, ranging from 0.92 to 2.94 in five provinces, implying that, compared with collateral loan, credit loan is much more preferred. Holding all other attributes constant, credit with amortization would carry interest rate premiums of 0.500, 2.24, 0.64 and

2.41 in Henan, Shandong, Sichuan and Shaanxi more than the same credit products with pay off at once as repayment method. However, farmers discounted credit with amortization at 0.98 less than based credit. The surveyed farmers are willing to pay about 1.0, 0.37, 1.05 more for credit from RCC, not from ABC in Shandong, Sichuan and Shaanxi. In contrast, farmers in Jiangsu and Henan are willing to pay less for credit from RCC than credit from ABC. Farmers' attitudes to credit from PSBC are similar with credit from RCC. The results also show that except for Sichuan province, farmers in other four provinces are willing to pay less for mobile banking service.

CHAPTER 6

CONCLUSION

Farmers are the core part of rural financial reform, and farmers' borrowing behavior is essential for rural financial markets to fully develop. Understanding farmers' preference for credit product attributes is important. Individual preferences play a crucial role in stimulating demand for credit. Based on a review of farmers' economic behavior characteristics, rural financial theories and researches, this study has examined the influencing factors of credit demand using discrete choice experiment and mixed Logit model. Using survey data from five provinces in rural China, the study found that farmers were generally willing to pay more for a host of attributes of loan product. Longer term of loan, credit loan, guaranteed loan and amortization loan were found to be positively valued by farmers.

The results of mixed Logit model indicate a downward sloping demand curve for credit. The lower of interest rate, the higher credit demand of farmers, which matches classic economic theory. Though the benchmark rate has becoming lower these years, the interest rate for loans in rural China is capped and allows little flexibility (Jia, Heidhues, & Zeller, 2010). To enhance credit demand efficiently, improving demand elasticity is important. High education level and flexibility in financial service have been shown to have a positive effect on the credit demand elasticity (Turvey, Ma, Kong, & Meagher, 2012). Improving education coverage and financial service flexibility, therefore, can spur credit demand when interest rates go down.

The finding with respect to high preference on longer term loan indicates risk attitudes of farmers. Based on our survey, the purpose of the majority of farmer are agricultural production, house construction and medical expenses. Agriculture production is a long-term activity with seasonal cycles and is vulnerable to nature resource and weather. House Construction and medical expenses also requires huge investment, which needs longer term to pay off the loan. Therefore, a corresponding long-term loan is more preferred than short-term loan for many farmers, even though longer term means higher prices. Long-term is risky to financial institutions, resulting in a reluctant attitude to issuing long-term loan. A loan which can adapted to seasonal agriculture production can significantly exert positive influence on farmer's credit demand.

The high WTP found in credit and guaranteed loan suggests that farm household favored loan with lower transaction cost both in money and time. They are also willing to pay for loan with flexible procedures. Nevertheless, for security concern, financial institutions expand collateral business line meanwhile cut-down credit and guaranteed loan business line. In rural China, agricultural land management mortgage reform has been carried out for several years. More and more farmer collateralize their land property to get loan from bank. At the end of 2016, the balance of land property mortgage in 232 counties was 14 billion yuan. The balance of house mortgage loan in 59 counties was 12.6 billion yuan. Collateral loan will be enhanced through completing land property mortgage system and law regulations. Improving service efficiency and flexibility as well as lowering transaction cost could definitely dig out more credit demand.

The respondents in our study are more likely to choose amortization as repayment method (except for farmers in Jiangsu). This suggests that with increasing requirement of large amount loan, paying off the loan at once is impractical and unsatisfied for loan applicants. Amortization cannot only ease the pressure of borrowers but also guarantee liquidity of financial institutions. For farmer who borrow small amount of loan, she/he has capacity to pay-off the loan at once and could continue to apply for a new loan. However, a large amount of people prefer to pay back portion of loan.

WTP of financial institutions vary from province to province, which may be explained by distinct financial environment. RCC is one of the major government-regulated source of rural credit in rural China. Compared with commercial bank like ABC and PSBC, RCC has customer resource, brand resource and market resource advantages. RCC is an institution with credibility, which is the most appealing attraction for farm household. This can explain high market shares of agricultural loan. RCC tend to be more commercial rather than cooperative during recent reforms, which enables RCC to provide more flexible and professional service.

Though smartphone coverage is wide, the insignificant estimates of parameters and negative sign of WTP indicates that Mobile Banking services have no contribution to attracting customers. The result implies that farmers remain neutral of mobile banking service when it comes to credit demand.

From the survey data, education level affects credit demand directly and indirectly. The higher the educational level, the more the credit demand of farmers in our sample. High education could also enhance farmers' perception of finance, which not only spurs farmers willingness to borrow loan but also enables them improve risk management.

Consequently, with improve financial education, the credit demand will likely rise in rural China.

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APPENDIX

Example of first-round Survey and Choice Experiment: Credit

Cornell University, Sichuan Agricultural University, Northwest Agricultural and Forestry University, Shandong University of Finance and Economics, Central University of Finance and Economics

Survey of Villagers to Assess Crop Insurance, Credit and Land Transfers

NARRATIVE TO BE READ TO RESPONDENTS: First of all I would like to thank you for taking the time to meet with us. This survey should take approximately 10 minutes and again I thank you for your time. The survey we are conducting is a joint product between The Central University of Finance and Economics, Sichuan Agricultural University, Northwest Agriculture and Forestry University and Cornell University in the United States. We are interested in collecting information in relation to credit. Your responses will be completely confidential and under no circumstances will your responses be identifiable. In addition we understand that you may not have all of the precise information available. In these cases all we ask is that you provide us with your best estimates or best judgments. Finally, you have the right to refuse to answer any question we might ask.

Given these objectives are you willing to participate in this survey? Yes No

If NO then "Ok, that is fine. For our records can you tell us why you do not want to participate?

NOTE to interviewer: If answer above is because respondent does not feel they have the information we need then ask why and explain again that we only require a best effort on their part, and that we expect that not all respondents will have precise information. And then ask if they will reconsider.

NOTE to interviewer: If answer above is related to privacy issues, then remind respondent that their participation will be most helpful to our research and that they will remain anonymous and that their privacy is guaranteed. And then ask if they will reconsider.

IF YES…." Thank you very much for your consent. Let us begin. We would like to start off by asking some general questions about your farm household"……. Go to question 1. DO NOT RECORD NAME OF RESPONDENT

Village _____

Date _____

Interviewer _____

A: Choice Experiment

Assume that you are going to apply credit. If you could only choose from the following two choices. Which one would you choose? (Please check only one of the boxes at the bottom of this page).

Interviewers should explain the meanings of each attribute to respondents.

Type of payment: pay off at one and amortization. Pay off at once means borrowers pays off the principal and interest of the loan at one time before or when the loan expires. Amortization is a way that the principal of the loan will be repaid in equal amounts with decreasing interest every month during the loan period
Type of institution: bank provides the loan, China's rural credit market is mainly served by Rural Credit Cooperatives (RCCs), Agricultural Bank of China (ABC) and Postal Savings Bank of China (PSBC).
Mobile Banking Service: bank providing mobile banking services to customers.

Certainty degree: from low to high, 1-5

The following choices provide you the transaction situations, which one you prefer to credit?

	Loan1	Loan2
Interest Rate	8%	10%
Term of Loan	5-30 Year	3-5 Year
Type of Lan	Guaranteed Loan	Credit Loan
Type of Repayment	Pay off at once	Amortization
Type of Institution	RCC	Commercial Bank
Mobile Banking	Yes	NO
Decision		
Level	1 2 3 4 5	

Farm Characteristics and Farmer Risk Attitude

number	question		unit	response
A1	farm characteristics	gender	0=female，1=male	
A2		age	age	
A3		Including yourself how many people live in this house	number of people	
A4		How many members of your household are primarily involved in agricultural work	number of people	
A5		How many members of your household earn off-farm wages	number of people	
A6		Are you the primary decision maker in agricultural affairs	0=no，1=yes	
A7		Do any household members work for village leader, village committee, state government, county government, state enterprise, and RCC or banks)	0=no，1=yes	
A8		What is your education level	0=Never Went to School，1=At least elementary school，2=At least middle school，3=At least high school，4=Some University or college，5=Completed College or University	
A9		How many years have you been farming	year	

A10		Compared with other farmers, your ability of cultivation is better	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
A11		What is the total size of your household farm (Mu, allocated Land Use rights, excluding land rented in)	mu	
A12		How much land do you rent in for agricultural use (total mu rented)	mu	
A13		In general, how would you describe the current agricultural business in your area compared to last year	1=GETTING WORSE, 2=ABOUT THE SAME,3=GETTING BETTER	
A14		Please list the top five crops you have grown in the past 12 months from the most valuable to the least valuable	1	
			2	
			3	
			4	
			5	
A15		Farm income	yuan	
A16		Off-farm income	yuan	
A17		Total income	yuan	
A18		Productive expenditure	yuan	
A19		Household Consumption expenditures (food,	yuan	

		clothes, health, education, etc)		
A20		Other expenditures (e.g. car, house, vacation travel)	yuan	
A21		Gross Incomes minus Expenditures	yuan	
B1	Sources of Risk and Risk Perceptions	Accepting greater production risks to increase the chance of higher profits is important to me	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
B2		I am more likely to take risks with new agricultural technologies (mechanical or management practices or input use) before I see good results on other farms	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
B3		I am willing to take risks with new management practices before I see good results in other farms	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
B4		Diversifying my crop (including livestock) mix in order to reduce risk is important to me	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	

B5		Having different Fields or farms at different locations (geographic diversification) is important to me	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
B6		I would consider growing more risky crops if I had (or have) greater access to irrigation	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
B7		I would, or do, sell my agricultural products over a period of time rather than at harvest in order to reduce market price risk (diversified marketing)	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
B8		I have (or would if I could) made some non-farm investments in new business, or financial assets like stocks and bonds in order to diversify household income.	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
B9		I am willing to ACCEPT more risk in all aspects of life relative to my peers (other farmers that you know)	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	

B10		In general, I believe that I TAKE more risks in all aspects of life than my peers.	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
C1	Precautionary Savings	What proportion of Household income (define income here as revenues minus productive expenses minus consumption and other non-productive expenditures) are you able to save in a year	1=none, 2=less than 5%, 3=3%-5%, 4=more than 10%	
C2		I save in case my house needs repair	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
C3		I save in case my automobile (e.g. car, motorcycle, tractor) breaks down.	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
C4		I save in case I cannot repay a loan from earnings.	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	

C5		I save for unexpected medical emergency	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
C6		I save in case I lose my job	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
C7		I save for unanticipated crop loss.	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
C8		In your opinion, do you think saving is important?	1=Strongly unimportant, 2=Moderately unimportant, 3=important, 4=Moderately important, 5=Strongly important	

Credit History and Credit Demand

1. Have your ever heard about credit
    a. I have never heard of a credit
    b. I am aware of credit but am not sure of its purpose.
    c. I am very familiar with credit
    d. I have applied credit
2. To what extent you know about land transfer center and land bank
    a. I have never heard of a Land Transfer Center (or Land Bank)
    b. I am aware of Land Transfer Centers, but am not sure of its purpose.
    c. I am very familiar with Land Transfer Centers
    d. I have had personal contact with a Land Transfer Center

3. How did you learn about land transfer center and land bank
    a. The Land Transfer Center contacted me with information
    b. My financial institution (RCC or bank) informed me
    c. The village leader informed me and other villagers
    d. Government provided information
    e. I was told of Land Transfer Centers by a friend or relative
    f. I saw information about Land Transfer Centers from public media such as television or the internet
4. Do you have credit demand
    a. Yes
    b. No

5. What's the purpose of credit
    a. Agricultural production
    b. House construction/renovation
    c. Purchase of car/motorcycle/bicycle
    d. Household consumption
    e. Medical expenses
    f. Education expenses

6. What is your preferred term of loan
    a. less than half year
    b. more than half year and less than 1 year_
    c. 1-3 years
    d. 3-5 years
    e. 5-30 years

7. What is your preferred source of credit
    a. Friends and Relatives
    b. Formal financial institutions (RCC ABC)

c. Informal Institutions (e.g. marketing cooperative, supply cooperative etc.)
d. Others

8. If you get a loan from formal institution, which one do you choose
    a. RCC
    b. Agriculture Bank of China
    c. Postal and Saving Bank of China
    d. Others

9. Which type of loan you prefer to get from the institution
    a. Credit Loan
    b. Collateral Loan
    c. Group Guaranteed Loan

10. What type of repayment you prefer to repay loan
    a. Pay off at once
    b. Amortization

11. Do you think is it important for you to decide credit product if there is mobile banking service
    a. Yes
    b. No
12. Time you firstly apply and receive loan_____

13. Did you apply credit in the last year
    a. Yes
    b. No

14. If yes, please fill the form

	Loan Amount	Annual Interest Rate
I owe no debt to institutions or friends or relatives	0	none
Friends/Relatives		
Formal Lenders (RCC, ABC, Postal Savings, etc.)		

Informal Institutions (Money Lender/ Pawn Shop)		
Other (Land Transfer Center)		

15. If yes, what's the purpose of credit
    a. Agricultural production
    b. House construction/renovation
    c. Purchase of car/motorcycle/bicycle
    d. Household consumption
    e. Medical expenses
    f. Education expenses

16. If you get loan from formal Institutions, please answer the following question
    a. If you get a loan from formal institution, which one do you choose
        i. RCC
        ii. ABC
        iii. Village Bank
        iv. Others
    b. Which kind of loan you get from the institution
        i. Credit Loan
        ii. Collateral Loan
        iii. Group Guaranteed Loan
    c. What's the reason for you to choose the institution above
        i. Lower interest rate
        ii. Flexible repayment method
        iii. Longer term
        iv. Better service quality
        v. Lower transaction cost
        vi. Other
17. Do you need more credit
    a. Yes
    b. No

18. Based on the asset, income and loan, what do you think of your credit
    a. Very low, need more loan, have no repayment risk
    b. Relatively low, want to have more loan, have some repayment risk
    c. Enough, the loan could satisfy the production demand
    d. Relatively high, have repayment risk
    e. Very high, have high repayment risk

19. Thinking about current interest rates charged by your local RCC or bank, if the interest rate was increased by 3% points (e.g. from 6% to 9%) would you
    a. Borrow a lot less
    b. Borrow less
    c. Borrow about the same amount
    d. Borrow more
    e. Borrow a lot more

20. Thinking about current interest rates charged by your local RCC of bank, if the interest rate was reduced by 3% (e.g. from 6% to 3%) would you
    a. Borrow a lot less
    b. Borrow less
    c. Borrow about the same amount
    d. Borrow more
    e. Borrow a lot more

21. Did you buy the crop insurance
    a. Yes
    b. No

22. Did you buy the any other kinds of insurance, such as endowment insurance, accident insurance, or property insurance
    a. Yes
    b. No

23. Have you bought any other kinds of insurance, such as endowment insurance, accident insurance, or property insurance
    a. Yes
    b. No

24. If yes, what kind of insurance you have bought:
    a. Endowment insurance,
    b. Medical insurance
    c. Employment injury insurance
    d. Unemployment insurance
    e. Others

25. I believe that access to credit would become far more important to me if I were to increase my farming operation by renting land (production rights) from a Land Transfer Center or from private individuals.

    Strongly Disagree____ Moderately Disagree _____ Agree_____ Moderately Agree_____ Strongly Agree _____

To be answered by interviewer only

1. In your opinion the respondent was engaged in this survey and answered truthfully all questions***?*** Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

2. In your opinion the quality of answers provided in this survey is adequate to include in any written reports. Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

Please make any other relevant comments here:
Example of first-round Survey and Choice Experiment: Credit (Chinese)

康奈尔大学，四川农业大学，西北农林科技大学，山东财经大学，中央财经大学

农村信贷调研农户问卷(“信贷”选择)

采访者需告知受访者: 首先，感谢您花费宝贵的时间接受我们的问卷采访。此次问卷采访需要花费您 20 分钟左右的时间。此次问卷调查是由中央财经大学，四川农业大学，山东财经大学，西北农林科技大学，美国康奈尔大学针对土地流转、作物保险、农村信贷合作科研项目发起的实地调研。

我们承诺：调查只涉及科学研究，不涉及商业活动，并对获取信息保密。除此之外，我们了解到您可能会对部分问题没有确切答案，在这种情况下，我们希望您能做出合理猜测或预估。最后，我们尊重您不参与调查的权利。
谢谢您的合作。祝您工作顺利，万事如意!

针对上述内容，您是否愿意参与此次调查

是_____　　否_____

若您不愿意参与此次调查，我们恳请您告知拒绝参与调查的原因:

采访者须知：如果受访者不愿参与调查，是担心本次问卷涉及到个人隐私，请再次向其强调"*本次调研完全匿名，并对获取信息保密，且您的参与对您们的调查极为重要*"。随后请再次确认受访者意愿。

若受访者同意参与调查：*非常感谢您的参与。下面我们将从询问您选择题开始。*

镇（街）名称 _____

村名 _____

调查者 _____

调查日期 _____

第一部分：选择题

采访者需向受访者解释各指标含义：

采访者需向受访者解释各指标含义：

还款方式：分为分期偿还贷款与一次性还清贷款。其中分期偿还贷款是指借款人在规定期限内分期还款包括等额本息还款、等额本金还款、按期付息还本、等额递增（减）等；一次性还清贷款是指借款人在贷款到期时一次性还清贷款的本息。

贷款银行：指提供贷款的银行，本问卷将贷款银行根据属性不同分为农村信用合作社、股份制商业银行以及邮政储蓄银行。其中，农信社（农商行）代表农村信用合作社、中国农业银行、村镇银行等代表股份制商业银行。

手机银行：指贷款银行向顾客提供手机银行服务，即农户可利用手机等移动终端办理相关银行业务。

您的选择肯定程度：指农户在做出选择后，对于该选择的肯定程度，肯定程度由 1-5 依次上升）

卡片 1：假设您有贷款需求，如果您只能从以下两种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	**贷款 2**
贷款利率	12%	14%
还款期限	5-30 年	3-5 年
贷款类型	信用贷款	担保贷款
还款方式	一次性还清贷款	分期偿还贷款
贷款银行	股份制商业银行	邮政储蓄银行
手机银行	是	是
您的选择		
您的选择肯定程度	1 2 3 4 5	

卡片 2：假设您有贷款需求，如果您只能从以下两种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	**贷款 2**
贷款利率	14%	6%
还款期限	0-0.5 年	1-3 年
贷款类型	担保贷款	担保贷款
还款方式	一次性还清贷款	分期偿还贷款
贷款银行	股份制商业银行	股份制商业银行
手机银行	是	是
您的选择		
您的选择肯定程度	1 2 3 4 5	

卡片 3：假设您有贷款需求，如果您只能从以下两种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2
贷款利率	8%	2%
还款期限	3-5 年	1-3 年
贷款类型	信用贷款	担保贷款
还款方式	分期偿还贷款	分期偿还贷款
贷款银行	邮政储蓄银行	股份制商业银行
手机银行	是	是
您的选择		
您的选择肯定程度	1 2 3 4 5	

卡片 4：假设您有贷款需求，如果您只能从以下两种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2
贷款利率	14%	12%
还款期限	3-5 年	5-30 年
贷款类型	抵押贷款	担保贷款
还款方式	一次性还清贷款	一次性还清贷款
贷款银行	农信社	邮政储蓄银行
手机银行	否	是
您的选择		
您的选择肯定程度	1 2 3 4 5	

卡片 5：假设您有贷款需求，如果您只能从以下两种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2
贷款利率	2%	6%
还款期限	0.5-1 年	0-0.5 年
贷款类型	担保贷款	信用贷款
还款方式	分期偿还贷款	分期偿还贷款
贷款银行	邮政储蓄银行	股份制商业银行
手机银行	是	是
您的选择		
您的选择肯定程度	1 2 3 4 5	

卡片 6：假设您有贷款需求，如果您只能从以下两种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2
贷款利率	4%	12%
还款期限	3-5 年	0-0.5 年
贷款类型	担保贷款	信用贷款
还款方式	分期偿还贷款	分期偿还贷款
贷款银行	股份制商业银行	邮政储蓄银行
手机银行	是	是
您的选择		
您的选择肯定程度	1 2 3 4 5	

第二部分：基本信息

采访者：本部分由人口及经济状况，风险意识，以及储蓄预防意识三部分组成，以表格的形式展现。请采访者就表格中的内容向受访者提问

序号	问题		单位	回答
A1	**人口及经济状况**	性别	0=女，1=男	
A2		年龄	岁	
A3		总人数（户籍人数）	人数	
A4		主要在家务农人数	人数	
A5		主要在外打工人数	人数	
A6		您是否为家中农业事务上的第一决策者	0=否，1=是	
A7		您家中成员是否参与村干部、村委会、农村信用合作社等银行、县市政府的工作	0=否，1=是	
A8		您的受教育程度	1=未上学，2=小学，3=初中，4=高中，5=职业学校或大学，6=已完成本科	
A9		您从事农业生产已经多少年	年	
A10		和同村其他农民相比，我的耕作能力更强	1=非常不同意，2=不同意，3=同意，4=比较同意，5=非常同意	
A11		您承包地总面积（不包括土地流转）	亩	
A12		您通过流转用于农业生产土地总面积	亩	
A13		您觉得目前本地区的农业产业形势和去年相比（农产品市场价格，政策导向等）	1=变差，2=持平，3=变好	
A14		请您列举去年内所耕种的 5 种作物，按价值从高到低	1	
			2	
			3	
			4	
			5	
A15		农业收入	元	

A16		非农业收入	元	
A17		总收入	元	
A18		生产支出[1]	元	
A19		生活消费开支[2]	元	
A20		其他支出[3]	元	
A21		收入盈余[4]	元	
B1	**风险意识**	您愿意接受更高的生产风险去增加更高收益的可能性	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	
B2		您愿意接受更高的风险首先尝试新的农业技术（和同村其他人相比）	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	
B3		您愿意接受更高的风险去首先尝试新的农业经营理念（和同村其他人相比）	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	
B4		您愿意通过种植多样化品种来降低风险	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	
B5		您愿意通过分散种植区域（地理多样化）来降低种植风险	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	
B6		您愿意在更好的灌溉条件下，种植更具风险的作物（去增加更高收益的可能性）	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	
B7		相比在收获时节出售农产品，您更愿意在分散时间段出售来降低市场价格风险	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	

[1] 主要包括农、林、牧、副、渔各业产品所耗费的种籽、饲料、燃料、生产工人工资、农机具折旧以及因管理生产和为生产服务而发生的各种费用

[2] 主要包括衣食住行、子女教育、医疗支出日常生活所涉及的支出等

[3] 主要包括非生产支出及非生活消费支出，例如：红白喜事、娱乐消费等。

[4] 收入盈余=总收入-总支出

B8		您愿意进行非农投资或者购买金融资产（例如股票、债券）降低收入单一化的风险	1=非常不愿意，2=比较不愿意， 3=愿意，4=比较愿意，5=非常愿意	
B9		相对于同村其他人，您更能够接受风险	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
B10		相对于同村其他人，您承担了更多的风险	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
C1	**储蓄及预防意识**	您储蓄的份额占您纯收入的多少	1=不存钱，2=少于 5%， 3=5%-10%，4=多于 10%	
C2		您存款是担心住房需要整修	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
C3		您存款是担心交通工具需要维修	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
C4		您存款是担心紧急医疗事故发生	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
C5		您存款是担心收入不足以支付贷款	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
C6		您存款是担心您失去日常经济来源（失业）	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
C7		您存款是担心预料外的农业生产损失	1=非常不同意，2=比较不同意， 3=同意，4=比较同意，5=非常同意	
C8		在您看来，存款储蓄是否重要	1=非常不重要，2=比较不重要，	

			3=重要，4=比较重要，5=非常重要	

第三部分：信贷水平与需求

采访者:

D1. 您对贷款是否有一定了解:_____

a. 您从未听说过
b. 听说过，不了解其业务或功能
c. 比较了解
d. 非常了解，且办理过此业务

D2. 您对土地流转中心或土地银行等流转平台的了解程度:_____

a. 您从未听说过土地流转中心或土地银行
b. 您知道土地流转中心，不了解其业务或功能
c. 您很了解土地流转中心或土地银行等流转平台
d. 您和土地流转中心等流转平台已有联系或合作

D3. 如果您了解土地流转中心等平台，您是通过什么途径了解的(可多选):_____

a. 土地流转中心上门联系，提供信息
b. 通过农村金融借贷组织的宣传了解
c. 基层组织（村委会等）鼓励宣传
d. 政府等相关部门的宣传，提供信息
e. 通过朋友亲戚的告知宣传
f. 公众渠道的信息宣传，例如电视或网站（土流网等）

D4. 您是否有贷款需求:

a. 是　　b. 否

D5. 若有贷款需求，您的贷款目的是什么（可多选）:_____

a. 农业生产
b. 修建房屋或房屋翻修
c. 购买或维修交通工具
d. 生活日常消费
e. 医疗开销
f. 子女教育

D7. 若有贷款需求，您更倾向于以下哪个还款期限（可多选）:_____

a. 少于半年
b. 半年到一年
c. 一年到三年
d. 三年到五年

e. 五年到三十年

D8. 若有贷款需求，您更倾向于哪种贷款来源:_____

a. 亲戚和朋友

b. 正规金融机构

c. 非正规金融机构

d. 其他(描述并填写)

D9. 若为正规金融机构，您更倾向于哪个机构:_____

a. 农村信用合作社

b. 股份制商业银行

c. 邮政储蓄银行

d. 其他

D10. 若为正规金融机构，您更倾向于获得哪种贷款:_____

a. 信用贷款　　b. 担保贷款　　c. 抵押贷款

D11. 若为正规金融机构，您更倾向于哪种还款方式:_____

a. 一次性还清贷款　　b. 分期偿还贷款

D12. 您认为贷款银行提供手机银行业务对您选择贷款是否重要:_____

a. 是　　b. 否

D13. 您第一次申请贷款并获得贷款的时间:_____

D14 .您是否在过去的一年时间里，有过借贷行为

a. 是　　b. 否

D15. 若有，请填写以下表格

	借款金额（元）	借款利率（年）
从亲戚朋友处获取借款		
从正规机构获得借款(农信社、农业银行等)		
从非正规金融机构处获得借款(典当、高利贷等)		
其他		

D16. 若有，您的贷款用途为（可多选）:_____

a. 农业生产

b. 购买或修建房屋

c. 购买或维修交通工具

d. 生活日常消费

e. 医疗开销

f. 子女教育

D17. 如果您从正规金融借款，请回答以下问题

a. 您是从以下哪个机构获得:_____

i. 农村信用合作社

ii.股份制商业银行

iii.邮政储蓄银行

iv.其他

b. 您选择此机构的原因是:_____

i. 贷款利率低

ii.还款期限灵活

iii.还款期限长

iv.服务质量高

v.贷款成本低

vi.其他

c. 您的贷款类型是什么:_____

i.信用贷款

ii.抵押贷款

iii.担保贷款

D18. 您有更多的信贷需求吗:_____

a. 是　　b. 否

D19. 根据您目前的资产、负债和生产收入，您认为您的贷款水平:_____

a. 非常低，您仍需要更多的贷款，且无还款风险

b. 较低，您可以获得更多贷款，但有一定还款风险

c. 足够，您现阶段的贷款满足您的生产需求

d. 比较高，具有一定还款风险

e. 非常高，有较高还款风险

D20. 基于当前的贷款利率（农信社或银行），如果贷款年利率增长 3%（例如：从 6%涨至 9%）:_____

a. 很大程度上减少贷款

b. 减少贷款

c. 不改变贷款金额

d. 增多贷款

e. 很大程度上增多贷款

D21. 基于当前的贷款利率（农信社或银行），如果贷款年利率减少 3%（例如：从 6%跌至 3%）:_____

a. 很大程度上减少贷款

b. 减少贷款

c. 不改变贷款金额

d. 增多贷款

e. 很大程度上增多贷款

D22. 您是否购买农业保险:_____

a. 是　　b. 否

D23 . 您是否购买其他保险（如:养老保险、医疗保险等）:_____

a. 是　　b. 否

D24. 您认为购买农业保险对于获得贷款是否重要:_____

a. 非常不重要　　b. 比较不重要　　c. 重要

d. 比较重要　　e. 非常重要

D25. 您认为获得贷款对于通过土地流入（从土地流转中心或者从私人处）扩大生产是否重要:_____

a. 非常不重要　　b. 比较不重要　　c. 重要

d. 比较重要　　e. 非常重要

第四部分：调研者回答

1. 在您看来，受访者有认真参与调查，并真实回答问题吗？
   非常不同意_____ 比较不同意_____ 同意_____
   比较同意_____ 非常不同意_____
2. 在您看来，以上问卷结果能用于正是研究报告吗？
   非常不同意_____ 比较不同意_____ 同意_____
   比较同意_____ 非常不同意_____

Example of second-round Survey and Choice Experiment: Credit

Cornell University, Sichuan Agricultural University, Northwest Agricultural and Forestry University, Shandong University of Finance and Economics, Central University of Finance and Economics

Survey of Villagers to Assess Crop Insurance, Credit and Land Transfers

NARRATIVE TO BE READ TO RESPONDENTS: First of all I would like to thank you for taking the time to meet with us. This survey should take approximately 10 minutes and again I thank you for your time. The survey we are conducting is a joint product between The Central University of Finance and Economics, Sichuan Agricultural University, Northwest Agriculture and Forestry University and Cornell University in the United States. We are interested in collecting information in relation to credit. Your responses will be completely confidential and under no circumstances will your responses be identifiable. In addition we understand that you may not have all of the precise information available. In these cases all we ask is that you provide us with your best estimates or best judgments. Finally, you have the right to refuse to answer any question we might ask.

Given these objectives are you willing to participate in this survey? Yes No

If NO then "*Ok, that is fine. For our records can you tell us why you do not want to participate?*

NOTE to interviewer: *If answer above is because respondent does not feel they have the information we need then ask why and explain again that we only require a best effort on their part, and that we expect that not all respondents will have precise information. And then ask if they will reconsider.*

NOTE to interviewer: If answer above is related to privacy issues, then remind respondent that their participation will be most helpful to our research and that they will remain anonymous and that their privacy is guaranteed. And then ask if they will reconsider.

IF YES…." *Thank you very much for your consent. Let us begin. We would like to start off by asking some general questions about your farm household*"……. Go to question 1. DO NOT RECORD NAME OF RESPONDENT

Village _____

Date _____

Interviewer _____

A: Choice Experiment

Assume that you are going to apply credit. If you could only choose from the following two choices. Which one would you choose? (Please check only one of the boxes at the bottom of this page).

Interviewers should explain the meanings of each attribute to respondents.

Type of payment: pay off at one and amortization. Pay off at once means borrowers pays off the principal and interest of the loan at one time before or when the loan expires. Amortization is a way that the principal of the loan will be repaid in equal amounts with decreasing interest every month during the loan period
Type of institution: bank provides the loan, China's rural credit market is mainly served by Rural Credit Cooperatives (RCCs), Agricultural Bank of China (ABC) and Postal Savings Bank of China (PSBC).
Mobile Banking Service: bank providing mobile banking services to customers.

Certainty degree: from low to high, 1-5

	LOAN ONE	LOAN TWO	LOAN THREE
Interest Rate	2% 	14% 	12% 
Term of Loan	5-30 Year 	3-5 Year 	0-0.5 Year 
Type of Loan	Collateral Loan 	Credit Loan 	Guaranteed Loan 
Type of Repayment	Amortization 	Pay off loan at once 	Pay off loan at once 
Institution	Commercial Bank 	RCC 	Postal Savings Bank of China 
Mobile Banking	Yes 	No 	No 
Decision			
Level	1 2 3 4 5		

Farm Characteristics and Farmer Risk Attitude

number	question		unit	response
A1	farm characteristics	gender	0=female，1=male	
A2		age	age	
A3		Including yourself how many people live in this house	number of people	
A4		How many members of your household are primarily involved in agricultural work	number of people	
A5		How many members of your household earn off-farm wages	number of people	
A6		Are you the primary decision maker in agricultural affairs	0=no，1=yes	
A7		Do any household members work for village leader, village committee, state government, county government, state enterprise, and RCC or banks)	0=no，1=yes	
A8		What is your education level	0=Never Went to School，1=At least elementary school，2=At least middle school，3=At least high school，4=Some University or college，5=Completed College or University	
A9		How many years have you been farming	year	

A10		Compared with other farmers, your ability of cultivation is better	1=Strongly Disagree, 2=Moderately Disagree , 3=Agree, 4=Moderately Agree, 5=Strongly Agree	
A11		What is the total size of your household farm (Mu, allocated Land Use rights, excluding land rented in)	mu	
A12		How much land do you rent in for agricultural use (total mu rented)	mu	
A13		In general, how would you describe the current agricultural business in your area compared to last year	1=GETTING WORSE, 2=ABOUT THE SAME,3=GETTING BETTER	
A14		Please list the top five crops you have grown in the past 12 months from the most valuable to the least valuable	1	
			2	
			3	
			4	
			5	
A15		Farm income	yuan	
A16		Off-farm income	yuan	
A17		Total income	yuan	
A18		Productive expenditure	yuan	
A19		Household Consumption expenditures (food, clothes, health, education, etc)	yuan	

A20		Other expenditures (e.g. car, house, vacation travel)	yuan	
A21		Gross Incomes minus Expenditures	yuan	
A22		To what extent you know about credit	a. I have never heard of Credit b. I am aware of Credit, but am not sure of its purpose. c. I am very familiar with Credit d. I have applied credit	
A23		What's the purpose of credit	a. Agricultural production b. House construction/renovation c. Purchase of car/motorcycle/bicycle d. Household consumption e. Medical expenses f. Education expenses	
A24		Based on the asset, income and loan, what do you think of your credit	a. Very low, need more loan, have no repayment risk b. Relatively low, want to have more loan, have some repayment risk c. Enough, the loan could satisfy the production demand d. Relatively high, have repayment risk e. Very high, have high repayment risk	
A25		The importance of attributes of credit(from low to high 1-5)	a. Interest rate b. Term of loan c. Type of loan d. Type of repayment e. Institution f. Mobile Banking	

To be answered by interviewer only

3. In your opinion the respondent was engaged in this survey and answered truthfully all questions***?*** Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

4. In your opinion the quality of answers provided in this survey is adequate to include in any written reports. Strongly Agree ___ Moderately Agree ___ Agree ____ Disagree ____ Strongly Disagree ____

Please make any other relevant comments here

Example of second-round Survey and Choice Experiment: Credit (Chinese)

康奈尔大学，四川农业大学，西北农林科技大学，山东财经大学，中央财经大学

农村信贷调研农户问卷(“信贷”选择)

采访者需告知受访者: 首先，感谢您花费宝贵的时间接受我们的问卷采访。此次问卷采访需要花费您 20 分钟左右的时间。此次问卷调查是由中央财经大学，四川农业大学，山东财经大学，西北农林科技大学，美国康奈尔大学针对土地流转、作物保险、农村信贷合作科研项目发起的实地调研。

我们承诺：调查只涉及科学研究，不涉及商业活动，并对获取信息保密。除此之外，我们了解到您可能会对部分问题没有确切答案，在这种情况下，我们希望您能做出合理猜测或预估。最后，我们尊重您不参与调查的权利。
谢谢您的合作。祝您工作顺利，万事如意!

针对上述内容，您是否愿意参与此次调查

是_____　　否_____

若您不愿意参与此次调查，我们恳请您告知拒绝参与调查的原因:

采访者须知：如果受访者不愿参与调查，是担心本次问卷涉及到个人隐私，请再次向其强调"*本次调研完全匿名，并对获取信息保密，且您的参与对您们的调查极为重要*"。随后请再次确认受访者意愿。

若受访者同意参与调查：*非常感谢您的参与。下面我们将从询问您选择题开始。*

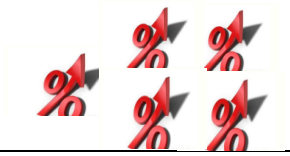
镇（街）名称 _____

村名 _____

调查者 _____

调查日期 _____

卡片 1：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	10% 	8% 	2% 
还款期限	5-30 年 	0.5-1 年 	0-0.5 年 
贷款类型	信用贷款 	抵押贷款 	担保贷款 
还款方式	一次性还清贷款 	分期付清贷款 	分期付清贷款 
贷款银行	中国邮政储蓄银行 	股份制商业银行 	农信社 
手机银行	否 	是 	是 
您的选择			
您的选择肯定程度	1 2 3 4 5		

卡片 2：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	8% 	2% 	6% 
还款期限	0-0.5 年 	0.5-1 年 	3-5 年 
贷款类型	抵押贷款 	信用贷款 	担保贷款 
还款方式	分期付清贷款 	一次性还清贷款 	分期付清贷款 
贷款银行	农信社 	股份制商业银行 	中国邮政储蓄银行 
手机银行	是 	否 	否 
您的选择			
您的选择肯定程度	1 2 3 4 5		

卡片 3：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	10% 	6% 	12% 
还款期限	0-0.5 年 	1-3 年 	3-5 年 
贷款类型	信用贷款 	担保贷款 	抵押贷款 
还款方式	分期付清贷款 	分期付清贷款 	一次性还清贷款 
贷款银行	中国邮政储蓄银行 	股份制商业银行 	农信社 
手机银行	否 	否 	是 
您的选择			
您的选择肯定程度	1 2 3 4 5		

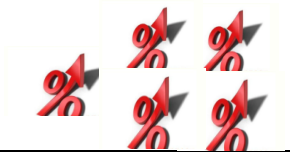
卡片 4：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	2% 	10% 	4% 
还款期限	3-5 年 	0.5-1 年 	5-30 年 
贷款类型	信用贷款 	担保贷款 	抵押贷款 
还款方式	分期付清贷款 	一次性还清贷款 	一次性还清贷款 
贷款银行	农信社 	中国邮政储蓄银行 	股份制商业银行 
手机银行	是 	是 	否 
您的选择			
您的选择肯定程度	1 2 3 4 5		

卡片 5：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	12% 	6% 	4% 
还款期限	3-5 年 	0-0.5 年 	1-3 年 
贷款类型	抵押贷款 	担保贷款 	信用贷款 
还款方式	分期付清贷款 	一次性还清贷款 	分期付清贷款 
贷款银行	中国邮政储蓄银行 	股份制商业银行 	农信社 
手机银行	否 	是 	否 
您的选择			
您的选择肯定程度	1 2 3 4 5		

卡片 6：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	10% 	12% 	14% 
还款期限	0.5-1 年 	5-30 年 	3-5 年 
贷款类型	信用贷款 	抵押贷款 	担保贷款 
还款方式	一次性还清贷款 	分期付清贷款 	一次性还清贷款 
贷款银行	股份制商业银行 	农信社 	中国邮政储蓄银行 
手机银行	是 	否 	否 
您的选择			
您的选择肯定程度	1 2 3 4 5		

卡片 7：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	8% 	10% 	4% 
还款期限	1-3 年 	0-0.5 年 	0.5-1 年 
贷款类型	信用贷款 	抵押贷款 	担保贷款 
还款方式	一次性还清贷款 	一次性还清贷款 	分期付清贷款 
贷款银行	股份制商业银行 	农信社 	中国邮政储蓄银行 
手机银行	否 	否 	是 
您的选择			
您的选择肯定程度	1 2 3 4 5		

卡片 8：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	6% 	14% 	4% 
还款期限	0.5-1 年 	5-30 年 	3-5 年 
贷款类型	担保贷款 	信用贷款 	抵押贷款 
还款方式	分期付清贷款 	分期付清贷款 	一次性还清贷款 
贷款银行	中国邮政储蓄银行 	农信社 	股份制商业银行 
手机银行	是 	是 	否 
您的选择			
您的选择肯定程度	1 2 3 4 5		

卡片 9：假设您有贷款需求，如果您只能从以下三种贷款中进行选择，下列哪一个是您的选择（请在选项下方一栏中标出您的选择）并勾选您选择的肯定程度。

	贷款 1	贷款 2	贷款 3
贷款利率	2% 	10% 	12% 
还款期限	0-0.5 年 	3-5 年 	0.5-1 年 
贷款类型	担保贷款 	抵押贷款 	信用贷款 
还款方式	一次性还清贷款 	分期付清贷款 	分期付清贷款 
贷款银行	中国邮政储蓄银行 	农信社 	股份制商业银行 
手机银行	否 	是 	是 
您的选择			
您的选择肯定程度	1 2 3 4 5		